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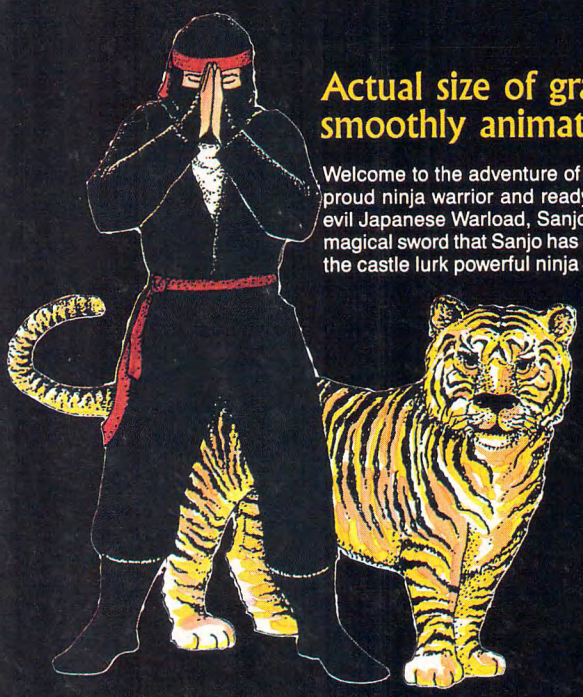

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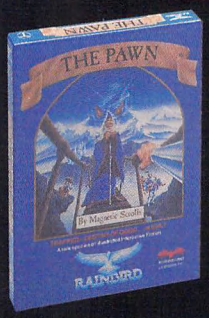

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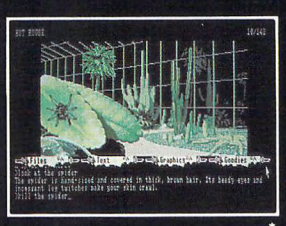

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THE EDITOR'S VIEW

We would like to say a fond farewell to Tom Halfhill, who has been editor of *COMPUTE!'s PC Magazine* since its inception in September, and who has been an insightful editorial leader for COMPUTE!'s publications group since 1982. We wish Tom the best in his new endeavors.

We'd also like to take this opportunity to mention that we have some exciting plans for this magazine. We'd prefer that you be surprised, so we won't give away too much here. An invigorating refocus of the magazine is underway, and you can look for those changes over the course of the next three issues. We've enlisted the expert resources of some of our PC-oriented staff, as well as some excellent outside contributors. Frankly, we're exhilarated about what's coming. We're sure you will be, too.

Thanks to all of you who responded to the readership survey (from the November 1987 issue). There are still a few returns trickling in, but we'd like to share with you some of the more interesting results. Two-thirds of the respondents previously owned (or still own) a computer other than a PC or compatible. Topping the list is Commodore (27 percent). The most commonly owned peripherals (excluding monitor and disk drive) are dot-matrix printers and modems (1200-bps is easily the top choice). In primary use of computer, 79 percent use their computer in the home, 37 percent at work, and 3 percent at school. In types of software purchased, the top five categories, in order, are word processing, spreadsheets, games/entertainment, database management, and programming languages. While almost one-quarter of the respondents do not program, 86 percent of those who do program use BASIC. Assembly language, Pascal, and C follow.

In terms of what you'd like to see in the magazine, the following areas—again, in order—drew the most response: general utilities, general-purpose home applications, DOS utilities, new products, and programming explanations/tutorials.

In response to what kinds of new products you'd most like to see reviewed, home applications and utilities topped the list. Finally, 60 percent favor the inclusion of source code on the disk.

There's an unexpected connection in all of this. The tabulation of readership responses had not even begun before we began developing the forthcoming changes in the magazine. The delightfully surprising result is that your areas of interest and what you'd most like to see are married very nicely with our plans.

Next month, look for some exciting new features as well as the announcement of our programming contest winners.

Lance Elko, Senior Editor

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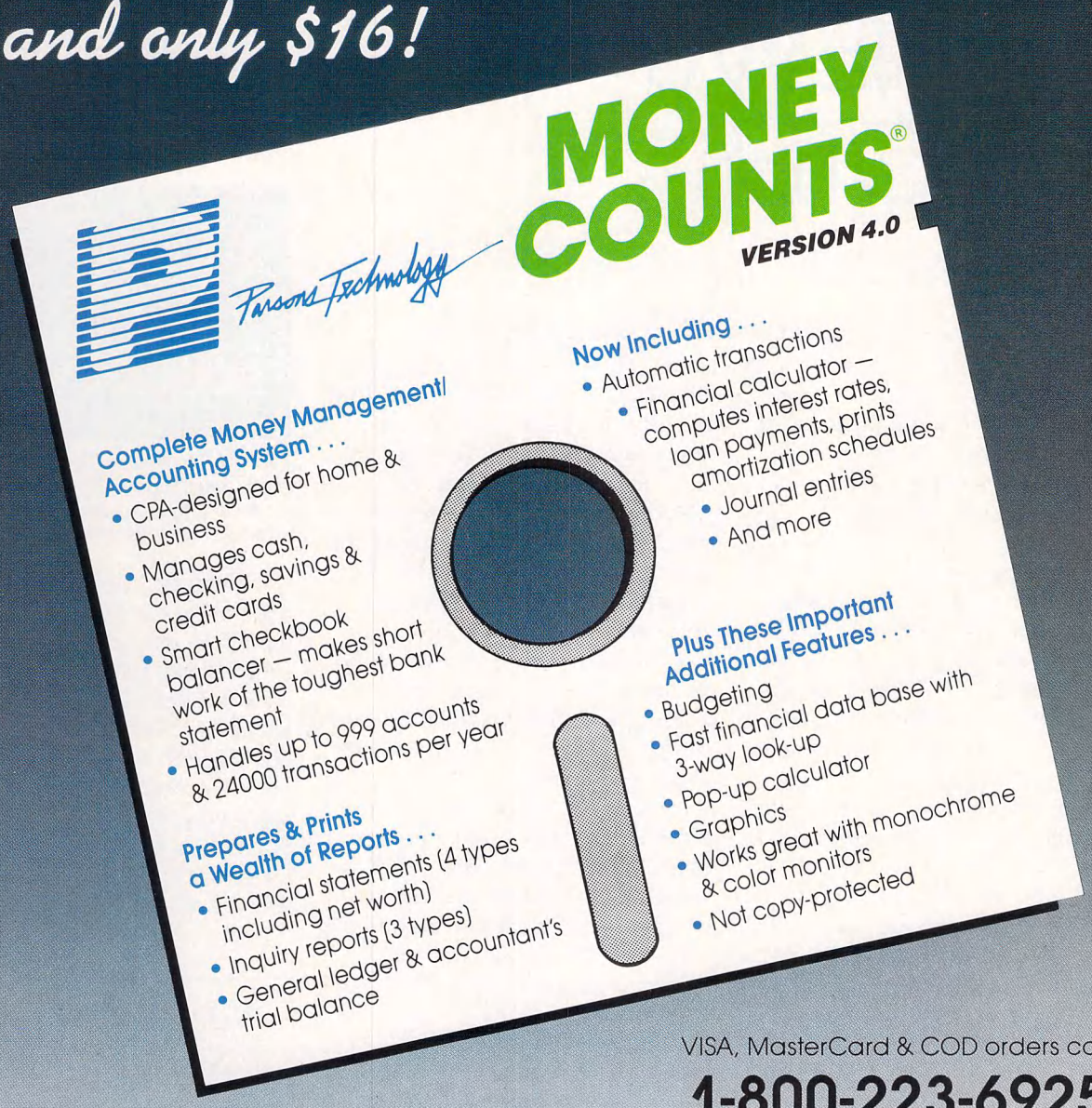
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PC NEWS & NOTES

Will the PS/2 Be Cloned?

"Any company can take the IBM PS/2 apart. Only one can put it all together," says a recent advertisement from IBM. Manufacturers of clone components have other ideas—but they might have to dodge some lawyers first.

As this is written, clones of the IBM Personal System/2 Models 50, 60, and 80 are marching toward production. The first wave will probably use motherboard components from two California firms, Chips and Technologies and Faraday Electronics; storage subsystem designs from Adaptec, a leading hard disk controller manufacturer; and Phoenix's PS/2-compatible Basic Input/Output System, or BIOS (see "PC News & Notes," March 1988). Graphics support will likely come from Video-7, which announced a video graphics array (VGA) chip set that it claims to be 100-percent hardware-register compatible with IBM's VGA standard.

When all this technology comes together, look for clones of the PS/2 Models 50 and 60 to be more compact, more expandable, and up to two-thirds faster than IBM's machines.

That is, if the technology doesn't get stalled in the courtroom. IBM lost millions of dollars in sales over the past few years to those who cloned the PC, XT, and AT, so PS/2 clone makers may face legal challenges designed to defend the proprietary status of the PS/2.

Oddly enough, the first lawsuits over PS/2 clones may not be filed by IBM. Although recent IBM advertising claims "We created a superhighway called Micro Channel," the technology that allows the Micro Channel Bus to configure a PS/2 system without requiring the user to set hardware switches was actually licensed from Computer Automation of California.

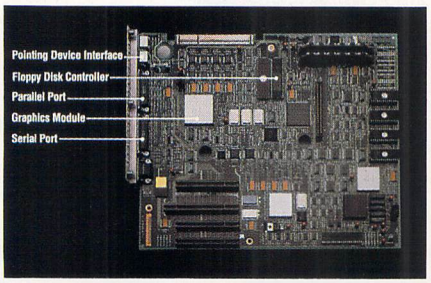
George Pratt, Computer Automation chairman, has stated, "We don't believe that potential licensees can produce PS/2 clones or Micro Channel-compatible boards without infringing on our patent. If Computer Automation is able to successfully litigate its claim, PS/2 clone manufacturers will have to cough up initial license fees ranging from $25,000 to $300,000 and a royalty of up to $26 per PS/2 clone system sold."

There's a battle brewing.

PS/2: Hit or Miss?

Meanwhile, there continue to be conflicting reports about the initial success of the IBM PS/2 series. In less than a year, IBM has shipped more than a million PS/2s to dealers—an impressive total, assuming a significant percentage of them have actually been sold. Yet, industry analysts say standard PC compatibles continue to outsell PS/2s by a three-to-one margin.

"Our sales of Model 30s, 60s, and 80s continue to be far below our initial projections," an analyst for a large computer chain recently told *COMPUTE!'s PC Magazine*. "Our volume is primarily based in AT and XT clones and Apple products. IBM's only hope may be in locking corporate users into some proprietary aspect of the Extended Edition of their OS/2."



An IBM Personal System/2 computer laid bare: Clone makers think they've cracked the technology, but they may still have to break the barrister barrier.

Industry observers are watching closely the initial acceptance of the OS/2 operating system. IBM shipped the first version of OS/2 back in December, a few weeks ahead of schedule. A scant 13 days later, Zenith became the first compatible manufacturer to ship Microsoft's version of OS/2. However, Microsoft's own projections don't foresee OS/2 becoming well established until about 1991.

News Flash: PS/2 Clones

Doubts over the future availability of 100-percent-compatible IBM PS/2 clones were recently laid to rest by Intel. The firm's Folsom Peripherals Division has been privately telling computer manufacturers that it is gearing up production of PS/2 chip sets to be available later this year. Intel's resources and long-term viability in the market make it a safe bet that there will be highly compatible PS/2 clones on dealer shelves by year-end. Interestingly, Intel is partly owned by IBM.

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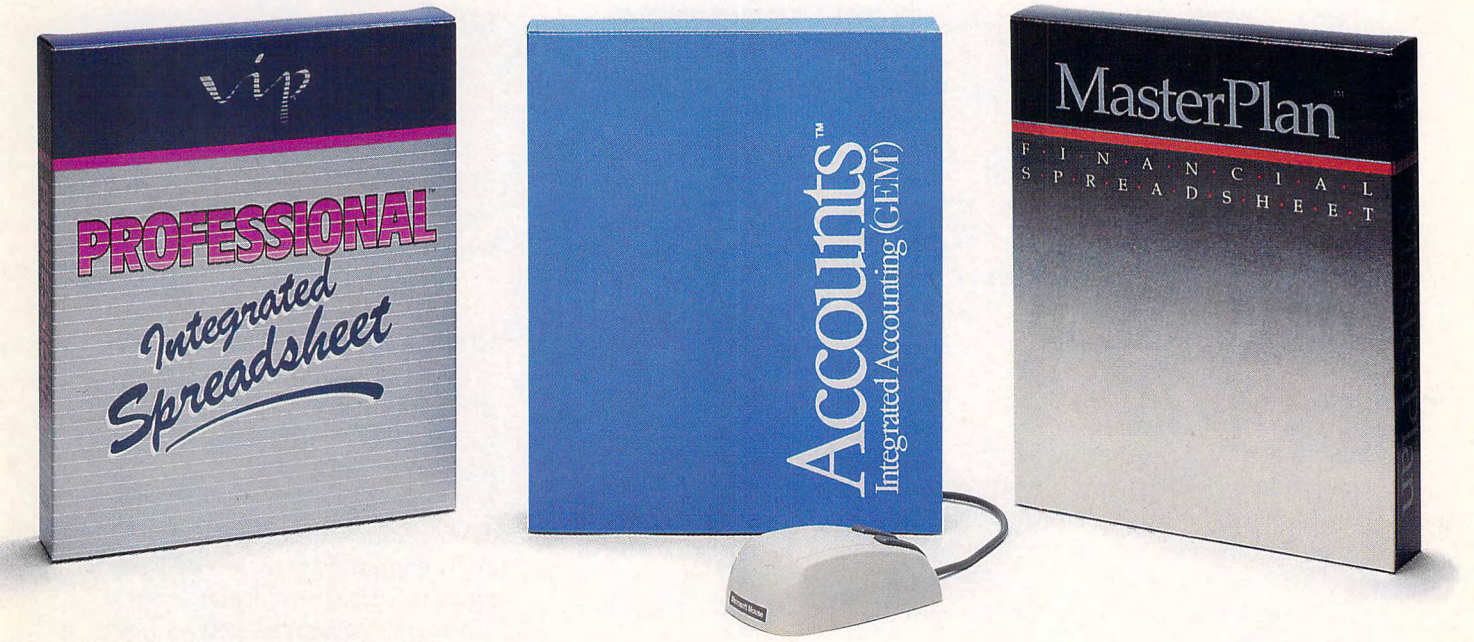

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Dollar Down; Prices Up

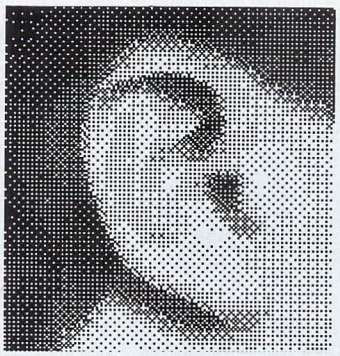
Last issue, we reported that new printers and other peripherals introduced at recent computer trade shows sported more features for less money. But now it appears at least some of those prices might be bouncing back up again, largely due to the unfavorable exchange rates between the U.S. dollar and the Japanese yen.

Although the average price of a PC-compatible system has dropped more than 50 percent over the last two years, the joyride may be ending. Printer prices are edging upward, with little relief in sight. Epson and other Japanese manufacturers have raised their prices to distributors by about 10 percent.

In addition, 3½-inch microfloppy disks are getting more expensive. Disk manufacturers have hiked their prices to compensate for the falling dollar, and the situation is being exacerbated by a shortage of the tiny media. The growing popularity of microfloppy drives in laptops, PC compatibles, and PS/2s is swallowing up the available supply.

THE EAR

News, rumors, and gossip heard around the PC community.



Shrinking Motherhood

You've heard of **motherboards,** the main circuit boards in personal computers . . . now are you ready for **motherchips?** Mosaic's new Silicon Circuit Board packs up to 100,000 logic gates onto a one-inch-square component that can hold up to 36 separate integrated circuits. The device has attracted the interest of large-scale computer manufacturers and the armed forces, and it may find its way into **laptop PCs** in a few years.

There Goes da Judge

It's back to **square one** in the two-year-old legal battle between chip manufacturers Intel and NEC. U.S. District Judge William Ingram has **removed himself from the case,** and the bulk of testimony from both parties must be resubmitted to a new presiding judge. Intel contends that NEC's widely used V-series of Intel-compatible microprocessor chips violates Intel copyrights. Judge Ingram belonged to a stock club that owned some Intel stock, and even though the judge's shares amounted to **less than $100,** NEC claimed it might prejudice his decision.

Why Intel Is Mad

While the courts are trying to decide whether NEC's V-series microprocessors are copies of Intel chips, owners of IBM PS/2 Model 25s have discovered they can increase the processing power of their systems by about 25 percent for **less than $50.** How? By replacing the Model 25's Intel 8086 microprocessor with NEC's optimized 8086-compatible V30/10 chip. The NEC microprocessor **significantly boosts** the Model 25's number-crunching abilities with no modifications to the system board. Users who are handy with a screwdriver and who aren't worried about voiding their warranty simply **remove the 8086** with a chip puller or nonconductive pry tool, and then just **pop in the V30.** Compatibility remains unaffected unless an optional 8087 math coprocessor has been installed in the Model 25.

But Don't Fry an Egg on It

Verbatim's new Data Life Plus floppy disks are **coated with Teflon** to reduce the risk of media damage from abusive handling. According to Verbatim, spills and fingerprints may be wiped off the disk's surface with a soft, lint-free cloth.

Under New Management

The Ear welcomes **a new face** to the computer publishing field this month. We hear that **Larry Flynt,** founder/publisher of *Hustler,* has acquired *ANALOG Computing* and *ST-Log,* a pair of magazines for Atari computer owners. The magazines have been relocated from Worcester, Massachusetts to Los Angeles.

Middle-Aged Spread

Some owners of Borland International's *Quattro* spreadsheet program are **a bit miffed** over one of the hit program's failings. It seems that *Quattro* is significantly more **memory hungry** than *Lotus 1-2-3.* Although the Borland product gets high marks on command and macro compatibility with *Lotus,* large *1-2-3* spreadsheets **just won't load** into *Quattro.* As one disgruntled power user complained, "Their ads claim that *Quattro* is 'fully compatible with all of your *1-2-3* files.' As far as I'm concerned, if you can't load a large *Lotus* file into *Quattro,* then it isn't fully compatible." Borland has **acknowledged the problem** and says it will attempt to rectify the situation in an unspecified future release.

Don't buy this game... if Rhett and Scarlet are your idea of

The Civil War

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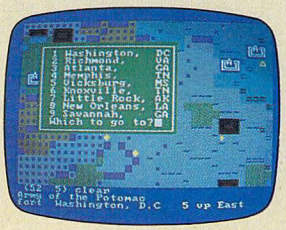

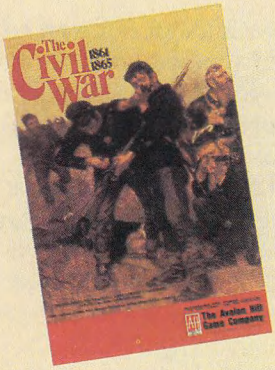

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What's New

As the prices of 80386 microprocessor chips continue to fall, owners of PCs, XTs, ATs, and compatibles who wish to upgrade their systems can now opt for replacement motherboards that will work with the cards already installed in their systems. Although replacing a system's motherboard may sound a bit extreme, it's often easier than installing an 80386 accelerator card, and the price is extremely competitive. The street price of popular 80386 motherboards is under $1,000, complete with a megabyte of memory.

Tandy has announced an 80286 accelerator card for its Model 1000 and 1000SX computers. Called the Tandy 286 Express, the card boosts performance two to six times, depending on the application. It is being manufactured for Tandy by PC Technologies of Ann Arbor, Michigan, and has a list price of $399.95. However, you may be able to find it on sale during Radio Shack promotions for less than $300.

Disk manufacturer Verbatim, now a subsidiary of Eastman Kodak, has announced development of a pocket-size cartridge that holds 50 megabytes of information. The 3½-inch erasable media uses magneto-optical technology, a hybrid of magnetic and laser storage techniques. Prototypes of both internal and external versions of the Magneto Optic Drives (MODs) are expected to appear at the Spring Computer Dealers Exposition (COMDEX), an industry trade show held annually in Atlanta in May. Estimated retail price of the MOD: $3,000.

Blue Chip Electronics, often credited with breaking the under-$1,000 price barrier for PCs, is counting on a new line of compatibles to reclaim its piece of the low-cost pie. The optimistically named Blue Chip Popular Model 20 comes with 512K of memory, one 5¼-inch floppy drive, and a 20-megabyte hard disk. Throw in a mouse, serial and parallel ports, a battery-backed clock/calendar, and a price tag of $1,199, and you have a system whose price compares favorably with many mail-order clones.

Another new Blue Chip, the PC Popular AT, checks in at $1,499. It doesn't include a hard disk at that price, but it does have 640K of memory, 50 percent more speed than a standard IBM PC AT, and a wide variety of graphics adapters, including an enhanced graphics adapter (EGA) and two video graphics array (VGA) modes.

Commodore is revamping its line of compatibles, too. By the time you read this, the Commodore PC-10 series of IBM PC compatibles should have been replaced by an inexpensive turbo machine that's twice as fast as present models. An AT compatible and high-speed 80386 machine are planned for later this year; prices have yet to be announced. Interestingly, Commodore's British subsidiary is already introducing the PC-60, a 16-megahertz 80386 machine with a megabyte of memory and a 40- or 80-megabyte hard disk drive.

On the printer scene, Hewlett-Packard unveiled the Deskjet, a 300-dot-per-inch ink-jet printer for $995. The DeskJet offers laser-quality text, multiple fonts, and hi-res graphics.

Flight simulator fans can enhance their wanders through the wild blue yonder with Maxx, a new joystick substitute that simulates the control yoke of an aircraft. Maxx's $129.95 price tag makes it a tad more expensive than your average joystick, but the device definitely adds a new dimension to such popular software as Electronic Arts' *Advanced Flight Trainer*, Microsoft's *Flight Simulator*, and MicroProse's *Gunship*.

Shopping for a laptop PC? Have less than a thousand bucks to spend? Now you've got three choices to pick from. The Toshiba 1000 and the Datavue Spark have been joined by Sharp's ten-pound PC-4501. At $995, the PC-4501 comes with 640K of memory and a supertwist LCD screen. **PC**

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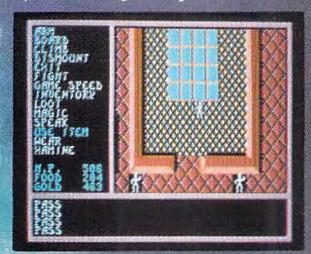

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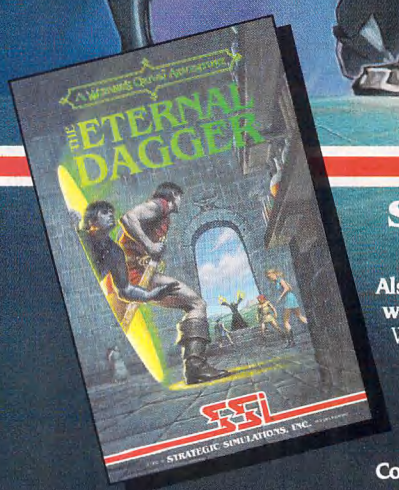

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Do you have a question or a problem about hardware or software? Or have you discovered something that could help other PC users? If so, we want to hear from you. Write to PC Feedback, COMPUTE!'s PC Magazine, *P.O. Box 5406, Greensboro, NC 27403. We regret that we cannot provide personal replies to technical questions.*

Editor's Note: Unsigned letters in this column are compilations from reader inquiries.

Caps On, Please

Whenever I turn on my computer, I like to start out with capital letters because they're easier to read. It's always a nuisance to remember to hit the CapsLock key. Is there a routine I could put in my AUTOEXEC.BAT file to turn on the CapsLock key at bootup?

Edward C. Taft

Yes. On this issue's magazine disk, you'll find a short program we wrote named CAPSON.COM. Copy this file onto the root directory of your boot disk and add the following line to your AUTOEXEC .BAT file:

CAPSON

This automatically runs the program and turns on the CapsLock key when you boot the computer.

Some IBM PC ATs and compatibles with enhanced keyboards boot up with the NumLock key turned on. If you begin every computer session by entering numbers into a spreadsheet with the numeric keypad, you probably like this feature. But many people find it annoying because it hampers use of the keypad cursor keys.

To solve this problem, we've written an additional short program named NUMOFF.COM; you'll find it, too, on this issue's magazine disk. NUMOFF.COM turns off the NumLock key at bootup. Simply copy it onto the root directory of your boot disk and insert the line NUMOFF in your AUTOEXEC.BAT file.

Here's how these two short programs work. Most computers and printers have banks of small DIP switches located somewhere on their circuit boards. These are physical switches that change the computer's or printer's behavior in some way. But there are also software-controlled switches that similarly change the computer's behavior. Usually, each bank of software switches occupies one byte of memory, with each bit of the byte acting as a switch. If a certain bit is set to 1, some feature is turned on. If it's set to 0, that feature is turned off.

The switches that control the settings of the CapsLock and NumLock keys are at memory location 1047 decimal (417 hexadecimal). CAPSON.COM and NUMOFF .COM are very short programs which flip the appropriate bits to change the status of these keys. For programmers, here's a DEBUG listing of CAPSON.COM:

```
0100  B80000   MOV  AX,0000
0103  8ED8     MOV  DS,AX
0105  BB1704   MOV  BX,0417
0108  8A07     MOV  AL,[BX]
010A  0C40     OR   AL,40
010C  8807     MOV  [BX],AL
010E  B44C     MOV  AH,4C
0110  CD21     INT  21
```

The listing for NUMOFF.COM is the same, except you need to replace this line:

OR AL,40

with this line:

AND AL,DF

No Text Editor Needed

Regarding your advice in "Readers' Feedback," November 1987, there is a simple way to add a line (such as DEVICE=ANSI.SYS) to an existing CONFIG.SYS file. You don't have to use a text editor or a word processor. The DOS COPY command can do it. If you enter

COPY CONFIG.SYS + CON

at the DOS command line, the computer copies the current contents of your CONFIG.SYS file back to CONFIG.SYS. Then it displays the filename (CONFIG.SYS) and CON and waits for you to add as many lines as you want to the file. Simply type the line and press Enter to continue on to the next line. When you've finished, press F6 or Ctrl-Z to write the amended file to the drive.

To be sure that the CONFIG.SYS file has been edited correctly, enter

TYPE CONFIG.SYS

to display the current file contents.

Vaughn E. Hathaway

Thanks for the tip. This technique can also be used to add lines to an AUTOEXEC .BAT file or even to create short batch files from scratch; simply specify a different filename instead of CONFIG.SYS.

When adding lines to batch files with this method, note that you can correct any typing errors in the line by backspacing and retyping, but once you've pressed Enter, you can't go back to correct errors. For that, you do need a text editor or word processor. Therefore, proofread the line carefully before pressing Enter.

Remember, too, that a CONFIG.SYS or an AUTOEXEC.BAT file must always be saved on the root directory of the boot disk. So before using this method, be sure the boot disk is in the current drive and that you're logged onto the root directory.

Changing a CONFIG.SYS or AUTOEXEC.BAT file does not implement the changes, of course. You must reboot the computer to execute the changes.

Copying Disks with a One-Drive System

My computer system has only one floppy disk drive and no hard disk. How can I copy one disk to another?

You can use the DISKCOPY program. DISKCOPY is a utility you'll find on your DOS disk. To run it, insert the DOS disk in your drive and enter

DISKCOPY

When DISKCOPY runs, it displays the message

Insert SOURCE disk in drive A:
Press any key when ready . . .

At this point, remove your DOS disk from the drive and insert the disk you want to copy (called the source disk*). Then press any key to continue.*

DOS begins reading information from the source disk. When it's finished, it displays a similar message which prompts

you to insert the disk on which you want to make the copy (called the target *or* destination disk*). After inserting the target disk, press any key to continue.*

Depending on the amount of memory in your computer system, you may have to swap the source and target disks in the drive more than once; simply follow the prompts. Since it's easy to get confused, be sure to have the source and target disks clearly marked. For even more safety, you can temporarily write-protect the source disk by placing a piece of tape over the write-enable notch along the side of the disk. This prevents the computer from writing to the source disk if you insert it in the drive when DOS asks for the target disk.

When DISKCOPY finishes, it asks if you want to repeat the copy process and copy another disk. Press Y for Yes or N for No.

It's not necessary to format the target disk before beginning the copy process, because DISKCOPY formats the target disk for you as it copies.

Be aware that DISKCOPY destroys all files which previously existed on the target disk, so be sure there's nothing on it you want to keep.

DISKCOPY's Only for Floppy Copies

I've tried to copy the magazine disk to my hard drive with the DISKCOPY command, but I can't get it to work. Is there another way to do it?

Chuck Bowers

Yes, but not with the DISKCOPY command; it's for use with floppy disks only. Use the COPY command instead.

DISKCOPY makes a mirror image of the source disk on the target disk. In the process, DISKCOPY destroys any files that already exist on the target disk. Since you most likely don't want to destroy everything on your hard disk, DOS protects you by refusing to execute DISKCOPY.

The fastest way to copy a floppy onto a hard disk is to use the COPY command with asterisks (*) for wildcard characters. (A wildcard character represents any one character or combination of characters; see your DOS manual for more details.) The following example copies all files from the floppy disk in drive A to a subdirectory called PC.MAY on drive C:

COPY A:*.* C:\PC.MAY

The two asterisks represent the filename and extension of each file on the disk in drive A.

Of course, this assumes that the subdirectory PC.MAY already exists. If it doesn't, you must create it with the MKDIR or MD commands.

Incidentally, you can't use DISKCOPY to copy a floppy disk to a ramdisk, either. If you want to copy an entire floppy to a ramdisk, you must use the COPY command with asterisks as shown in the example.

Getting to the Root

I know I'm supposed to put any CONFIG.SYS or AUTOEXEC.BAT files in the root directory. But what's a root directory, and how do I know when I'm in it?

The root directory is the main directory of a disk, whether it's a floppy or a hard disk.

You may be aware that DOS has a command called MKDIR or MD which makes a new directory. If you've never used this command, you may wonder how a disk can have more than one directory. Actually, a disk can have many directories, and it's a good way to keep files organized on hard disks and high-density floppies. You can keep text files in one directory, spreadsheet files in another directory, and utility programs in yet another directory. In fact, this method is virtually required to avoid confusion when using hard disks, due to their vast capacity.

Every disk, when freshly formatted, has only one directory: the root directory. To make additional directories, you use the DOS command MKDIR or MD (two forms of the same command). For example:

MD LETTERS

This creates a new directory named LETTERS on the disk. Directories created in this fashion are often called subdirectories *to distinguish them from the root directory. The prefix* sub *also describes the subdirectory's relationship to the root directory: It is subordinate to, or contained within, the root directory.*

The most common analogy is to compare a directory structure to a tree. At the base of the trunk is the root directory. Subdirectories branch off from the trunk.

A subdirectory may contain files, just like a root directory. A subdirectory is sort of like a "disk within a disk."

As you know, the DIR command normally displays a list of the files in the current root directory. You can also use DIR to display a list of files in any other directory, including a subdirectory. The first step is to log onto *that directory. This is analogous to switching default drives (such as logging onto drive B instead of drive A). To log onto a subdirectory, you use the DOS command CHDIR or CD (again, two forms of the same command). Example:*

CD LETTERS

Now when you type DIR, the directory listing that appears is for the subdirectory LETTERS instead of for the root directory.

Whenever you want to know which directory you're logged onto, enter

CD

by itself at the DOS prompt. DOS responds with the current drive letter and the name of any subdirectory you're logged onto. If you're in the root directory, it responds with the drive letter and a backslash. For example, if you're in the root directory of drive A, DOS responds with

A:

If you're logged onto a subdirectory and want to move back to the root directory, enter the CD command with a backslash:

**CD **

It's easy to change the DOS prompt to keep yourself informed about which directory you're logged onto. At the DOS prompt, enter

PROMPT PG

and DOS always displays the current drive and directory as part of the prompt. The $P in the command above instructs DOS to print the current drive and directory, and $G instructs it to display the familiar greater-than sign (>).

We've barely touched on the subject of directory structures here; for more information, consult your DOS manual.

Repeat Performance

I have a lot of correspondence stored on disk. Sometimes I need to find a certain letter. It's a lot of work to load each one into my word processor to see if it's the one I want. Is there a quicker way to do it?

You can make the task easier with a short batch file and the DOS FIND utility. You'll find FIND on your DOS master disk. You can create the batch file with a word processor, a text editor, or the COPY CON method described above. Enter these lines:

```
IF EXIST STUFF DEL STUFF
FOR %%P IN (*.DOC) DO FIND /C "%1"
  %%P >> STUFF
TYPE STUFF
```

If you create this batch file with a word processor, be sure to save it in ASCII (plain text) format. Also make sure the filename has the .BAT extension. For this example, HUNT.BAT is a good name.

When you need to find a certain letter, type HUNT at the DOS prompt and follow it with a word or phrase you know is contained in the letter you're looking

for. For example, if you enter

HUNT Dear Mom:

the batch file looks for the phrase Dear Mom: *in every file in the current directory that has a .DOC extension. Note that you don't enter quotation marks around* Dear Mom: *on the command line; the batch file enters them for you.*

The batch file displays the name of each file it examines and a count of how many times the phrase appears in each file. For example, if it displays

```
----------LETTER01.DOC: 0
----------LETTER02.DOC: 2
----------LETTER03.DOC: 1
```

you know that the phrase occurs twice in LETTER02, once in LETTER03, but not at all in LETTER01. With little trouble, you'll know which files are letters to Mom.

You can enter any phrase after HUNT on the command line. The FIND utility is case-sensitive, so it searches for the phrase exactly as you enter it. (In other words, it won't find any occurrences of DEAR MOM.*)*

Note that this batch file searches only through text files—those which are created with a word processor or text editor. It won't search through program files ending with .EXE or .COM.

*Of course, you can substitute any wildcard file description for *.DOC in the example above. This description specifies which files HUNT searches. For instance, to search files ending in .TXT, substitute *.TXT for *.DOC in the batch file. If you want to look for occurrences of a certain procedure in a number of Pascal source code files, you can substitute *.PAS for *.DOC.*

Let's see how this batch file works so you can modify it further to meet your own needs.

The first line determines whether a file called STUFF exists in the current directory. If it does, the batch file deletes it to make room for a temporary file of the same name. You can replace STUFF with any filename of your choice, such as SCRATCH or TEMP. It's just a place where FIND sends output.

The second line looks a little like hieroglyphics, so let's take it apart to make it more understandable. FOR is the batch file command which instructs DOS to repeat a command or a program. The command or program to be repeated follows DO—the FIND utility in this example.

IN (.DOC) is a* mask, *or a filename description containing wildcard characters which fits a number of files. This particular mask fits any file ending with the extension .DOC. The %%P which you see repeated twice is a variable that represents, in turn, each file that fits the *.DOC mask. For example, it represents LETTER01.DOC, LETTER02.DOC, and so on, during each repetition of FIND. Note that P is preceded by two percent signs, not just one.*

The %1 is another variable which represents the phrase entered on the command line following HUNT. In this example, that's Dear Mom:.

In effect, the batch file simulates the following separate commands:

```
FIND /C "Dear Mom:" LETTER01.DOC
FIND /C "Dear Mom:" LETTER02.DOC
FIND /C "Dear Mom:" LETTER03.DOC
```

and so on. The FOR-DO command repeats the entries for you.

The /C following FIND instructs FIND to count the number of times the string in double quotation marks occurs in the filename which follows. See your DOS manual for more information about the FIND utility.

Each time the batch file executes FIND, it adds a line containing the results to the STUFF file. The double greater-than sign (>>) instructs DOS to append each line to the STUFF file. (Don't enter a single greater-than sign instead of the double signs. If you do, STUFF will contain only the last line of output from FIND. Previous lines will be overwritten.) Keeping the output in a file like STUFF allows you to load it into a word processor for easier reading.

DOS batch files which repeat commands have many uses. For example, here's a one-line batch file that prints out a list of all files in a directory ending with .PAS:

```
FOR %%P IN (*.PAS) DO COPY %%P
  PRN
```

Make sure the printer is ready before executing this batch file.

More Strange Characters

When I run "RoboKey" from the January 1987 issue of *COMPUTE!'s PC Magazine*, I receive some strange characters when I try to make an entry. They look like this:

←[C←[←[C←[C

Then the computer locks up. What's the problem?

Quentin R. Sampson

To make "RoboKey" work properly, you must have the ANSI.SYS device driver installed on your system. We regret that we didn't include this information in the article.

The strange characters you're seeing on the screen are ANSI escape sequences. Whenever you see this pattern when running a program, it means the program is attempting to use the ANSI.SYS device driver to perform some function. The function it performs in this case is to print keystrokes on the screen.

ANSI escape sequences always follow a pattern. They begin with a left-arrow character (←). This is the way the computer displays the escape character. Following is a left bracket ([) and then some codes.

To get rid of the visible sequences and run the program properly, you must install the ANSI.SYS device driver on your computer. To do this, you must insert the line

DEVICE = ANSI.SYS

in your CONFIG.SYS file. Then reboot the computer.

The ANSI.SYS file is on your DOS master disk. It must be copied onto the root directory of the disk you boot from along with the CONFIG.SYS file. If you're using a floppy drive system, copy ANSI .SYS and CONFIG.SYS onto the root directory of the disk you insert in drive A when switching on the computer; with hard drive systems, copy ANSI.SYS and CONFIG.SYS onto the root directory of the hard disk (usually drive C). If you're not sure how to create a CONFIG.SYS file, consult your DOS manual.

ANSI.SYS is widely used to provide keyboard and screen support for software. For this reason, installation of ANSI.SYS should be standard practice for anyone who uses a PC, AT, or compatible.

Why Balk When You Can Run?

How can I tell from a disk directory which programs are runnable and which aren't? If I enter the names of some files at the DOS command line, the computer prints an error message or locks up.

DOS runs three kinds of programs—those with the file extensions .COM, .EXE, and .BAT. (The extension *is the optional part of a filename which follows the period; it can be up to three characters long.) While there are important differences in the structure of these files, you can enter the name of any file ending with one of these extensions and expect DOS to run it.*

File extensions other than these three are added for clarity and identification. For example, your word processor produces text files which may have .TXT or .DOC extensions. Some software adds its own extensions. For example, dBASE *adds the .DBF extension to its database files. None of these files can be run.*

BASIC programs conventionally end with a .BAS extension. To run these, put a copy of BASIC in the current directory or drive. Then enter BASIC [drive_letter :]filename *on the DOS command line. The drive letter is the drive which contains the BASIC program. You don't have to enter it if both BASIC and the .BAS program are in the current directory or drive.*

Understanding DEBUG's Segmented Addresses

I've done some machine language programming on a Commodore 64, but now I'm interested in learning some IBM 8088 assembly language. I've used DEBUG to look at some programs, but I can't figure out where the program is located in memory. How do you read the segmented addresses that DEBUG displays?

Segmented addresses are sort of like hexadecimal numbers; you can become familiar with them, but they'll probably never become second nature. Here are some hints.

A segmented address in DEBUG looks like this:

A000:0100

The part on the left (A000) is called the segment, *and the part on the right (0100) is called the* offset. *Both the segment and the offset are expressed in hexadecimal, like all DEBUG numbers. If you put a 0 on the right of the segment and then add the offset, you'll have the absolute memory address. For example, the address above becomes*

A0000 + 0100 = A0100

Remember that the segment part of the address is always an absolute memory address with the final 0 omitted. The offset is then merely added to it.

Segmented addresses become more confusing when you consider that any one absolute memory address may have a number of different segmented expressions—4094 of them, in fact. For example, the absolute address above can also be expressed in segmented form as

A010:0000

If you put a 0 on the right of the segment and add the offset, you can see that they refer to the same absolute address:

A0100 + 0000 = A0100

This is easier to understand if you think of the segment part of the address as specifying the absolute address (with the right 0 omitted) of the beginning of a 64K block of memory, with the offset specifying where in that 64K block something is located. These 64K blocks can overlap, as you can see above. Any absolute address can have a different segmented expression in each 64K block.

Why does DEBUG use the complicated segmented form of the address when the absolute address is much easier to understand? There are several reasons. You'll notice that the absolute address has five hexadecimal digits. This is the number of hexadecimal digits required to address one megabyte of memory, which is the amount that the 8088/8086 family can directly address. (A megabyte is 100000 bytes in hexadecimal.)

No register in the 8088/8086 family is large enough to hold a five-digit address. So a five-digit address must be broken into two parts which fit into two registers. This is the segmented form of the address.

Another reason for using segmented addresses is that in the IBM PC, a program can be placed almost anywhere in memory. When DOS loads a program, it first finds a free block of memory for the program. Then it puts the segment value of the address of the beginning of that block in certain segment registers. Finally, it loads the program starting at that location.

TONTO! and Printer Control Commands

I've experienced a problem with the printer setup utility in "TONTO!" (March 1988.) I used TONTOPRT to make a special configuration file for my make of printer. Then I loaded TONTO! using the /P= option, which tells it to load the configuration file. But TONTO! doesn't seem to send the proper codes. Whenever a command contains a 0, TONTO! won't send it correctly. Is there a way to fix the problem?

Dave Jaynes

The printer setup utility which is built into TONTO! operates correctly. What follows is applicable only if you make a special configuration file with the TONTOPRT utility, and only if some printer command you want to use contains a 0.

One rather confusing aspect of printer codes is the difference between 0 and "0". One is a binary zero, the other is the ASCII value for the character "0"—which is a binary 48. Generally, to indicate the difference, printer manuals enclose the 0 in quotes. To include a "0" character in a command in the TONTOPRT utility, you must enter the value 48 in the appropriate place in TONTOPRT.

Few printer control commands contain a binary 0, so most people won't experience any difficulty. However, a few do contain the binary 0—mostly to turn off some special characteristic (superscript, for instance) which has already been turned on. If you are certain that you do need to send a binary 0 to your printer, you must alter TONTO!. Here's how to do it.

You'll need a copy of DEBUG, a utility you'll find on your DOS master disk. Put a copy of DEBUG.COM and TONTO .COM on the same disk or in the same directory and enter:

DEBUG TONTO.COM

Be sure you include the .COM extension on the end of the command as shown above, or DEBUG won't be able to find the file. When DEBUG loads, it loads TONTO! and then displays the minus sign which is its prompt.

At the minus-sign prompt, enter the following DEBUG commands:

```
E    1869 90,90  <Enter>
W      <Enter>
Q      <Enter>
```

Be sure to enter the commands exactly as shown, or the fix won't work. The first line replaces the instruction which prevents TONTO! from sending binary 0's to the printer with No Operation (NOP) instructions. The W command writes the amended file to the current drive, and the final command Quits DEBUG.

It's a good idea to put aside the new version of TONTO! and delete any old copies. There is no way to distinguish the new version from a copy of the old version, since the file sizes are identical. If the old version of TONTO! is memory-resident, reboot the computer before you attempt to load the amended version with your printer configuration file. Note that you don't have to make any changes in the TONTOPRT configuration utility or in your printer configuration file to affect changes. All changes are made to TONTO! itself.

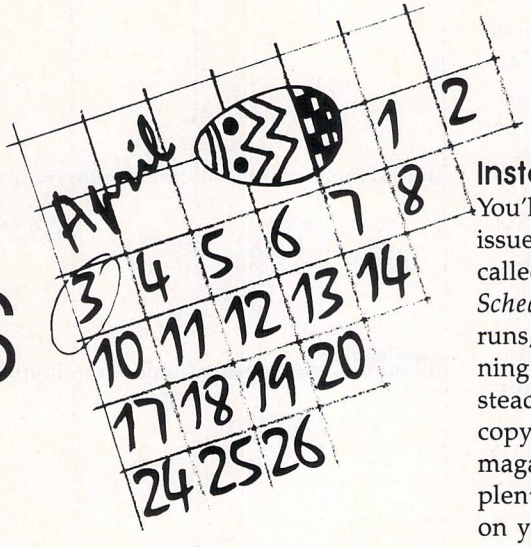
PC-ART Filenames

I have a problem with *PC-ART* ("Best of the Boards") in the January 1988 issue of *COMPUTE!'s PC Magazine*. When I try to load the demonstration screen DEMO .PIC, I press Alt-F1 and enter DEMO .PIC. Then the program crashes, and I get an error message. What's wrong?

George Hill

You entered the file extension .PIC after the filename DEMO. PC-ART *automatically adds the extension .PIC to a filename for you, so you don't have to type it. Enter DEMO or another filename alone, without an extension.* **PC**

BEST OF THE BOARDS



Quick Scheduler

"Best of the Boards" features outstanding programs gathered from bulletin board systems throughout the country. Some of the programs are in the public domain; some are copyrighted shareware programs (freely distributed in return for voluntary donations). In each case, COMPUTE!'s PC Magazine *obtains the program directly from the original author in return for a publication fee. We then test the program, rework the documentation, and present the polished package here.*

This issue's featured program is Quick Scheduler *by William A. Anderson. It provides a calendar that allows you to enter appointments and notes for any date in the year. It automatically informs you of holidays, and you can easily repeat a note on any date. It also prints a hardcopy of the calendar for any month or series of months, making it ideal for anyone who needs to share an itinerary or schedule with others. It runs on any IBM PC, XT, AT, or compatible with at least 256K of memory and DOS 2.0 or higher. It won't work on the PCjr. A printer is recommended.*

Program by
William A. Anderson
Column by
George Campbell

Do you need a schedule of upcoming events that can be passed on to others? With *Quick Scheduler,* you can create and print one or more copies of a schedule for a month or an entire year. Or perhaps you're planning a trip, and you'd like to give your friends and relatives a copy of your itinerary; *Quick Scheduler* can handle that, too. Or maybe you need a planning calendar, a place where you can keep track of appointments, such as "10:30—Take Bowser to vet" or "Today is Mom's birthday." Again, *Quick Scheduler* is the answer.

Quick Scheduler is a general-purpose scheduling tool written in Microsoft *QuickBASIC.* With *Quick Scheduler,* you can create a calendar on which you jot down appointments, holidays, important events, and other information. Then you can check your schedule with the touch of a key. Because you can also print a copy of the calendar on your printer—one month at a time, or even an entire year—you can share your schedule with others.

Quick Scheduler runs on any IBM PC, XT, AT, or compatible (except the IBM PCjr) with at least 256K of memory and DOS 2.0 or higher. Since it relies on text-mode graphics characters, it works with any display adapter and monitor. A printer that's compatible with the IBM character set is highly recommended.

Installing the Program

You'll find *Quick Scheduler* on this issue's magazine disk in a file called CALENDAR.EXE. *Quick Scheduler* creates a data file when it runs, so we don't recommend running it from the magazine disk. Instead, before using *Quick Scheduler,* copy CALENDAR.EXE from the magazine disk to a floppy disk with plenty of room or to a subdirectory on your hard drive.

On hard drive systems, start by creating a new subdirectory; \CALENDAR would be a good choice. To do this, enter the following series of commands:

```
CD \
MD CALENDAR
CD CALENDAR
```

Then place the magazine disk in drive A and enter the following command:

```
COPY A:CALENDAR.EXE
```

Creating a Calendar File

Now you're ready to run *Quick Scheduler.* First, be sure your computer's system date is correct. To check, enter DATE at the DOS prompt. If the correct date isn't shown, enter it now, because *Quick Scheduler* won't work properly without it. If your computer system has a battery-powered clock, you probably won't have to worry about this.

Enter CALENDAR at the DOS prompt to run *Quick Scheduler.* The first thing you'll see is the program's main menu. The first time you use *Quick Scheduler,* you should press I to select this option:

I) Initialize file for a New Year.

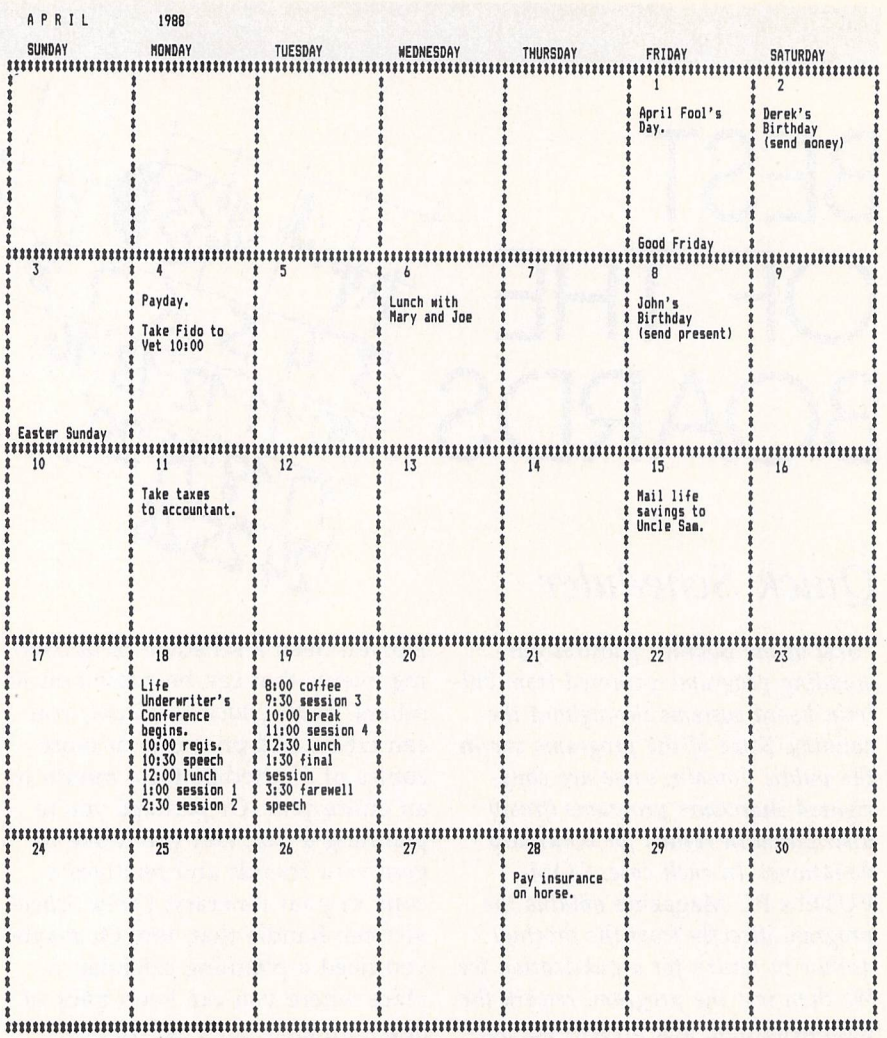
In the future, you'll need to select this option only when creating a new calendar for a new year.

After you press I, *Quick Scheduler* prompts you for the last two digits of a year. By default, the pro-

gram displays the last two digits of the current year according to the system date (such as 88 for 1988). If this is correct, press Enter to continue. If you wish to create a calendar for a future year, you can. Just enter the last two digits of any year up to 1999. (Don't choose a year earlier than 1987; if you do, *Quick Scheduler* prints an error message.)

When you've selected a year, *Quick Scheduler* creates a data file on disk for that year called YEAR .DAT. This file must be present in the current drive and directory for *Quick Scheduler* to maintain the data you'll enter in the calendar. If *Quick Scheduler* can't find YEAR .DAT in the current directory, it prints an error message when you attempt to work on the calendar.

Next, *Quick Scheduler* asks whether you want to insert holidays into your calendar. Press Y to automatically insert all generally observed holidays; otherwise, press N. The program then returns to the main menu.



APRIL 1988

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1 April Fool's Day. Good Friday	2 Derek's Birthday (send money)
3 Easter Sunday	4 Payday. Take Fido to Vet 10:00	5	6 Lunch with Mary and Joe	7	8 John's Birthday (send present)	9
10	11 Take taxes to accountant.	12	13	14	15 Mail life savings to Uncle Sam.	16
17	18 Life Underwriter's Conference begins. 10:00 regis. 10:30 speech 12:00 lunch 1:00 session 1 2:30 session 2	19 8:00 coffee 9:30 session 3 10:00 break 11:00 session 4 12:30 lunch 1:30 final session 3:30 farewell speech	20	21	22	23
24	25	26	27	28 Pay insurance on horse.	29	30

With Quick Scheduler, *it's easy to make handy appointment planners like this.*

Setting Printer Codes

If you intend to print your calendar, the next step is to specify the appropriate printer control codes. Press E to bring up a screen where you can enter these codes.

The process is simple, but you must know the codes which control condensed type and vary the line spacing on your printer. You can find this information in your printer manual.

Quick Scheduler needs codes for four printer commands: those controlling eight-lines-per-inch spacing, six-lines-per-inch spacing, condensed type, and regular type. Enter each printer command on the appropriate line by typing the ASCII codes where indicated by the cursor. Many printer commands begin with the code for the escape character, which is 27. If your printer manual refers to the escape character, enter 27 as its code.

Press the Enter key after typing each code. Space is provided for up to ten codes on each line, which is probably more than you'll need. Bypass unneeded code spaces by pressing Enter or the cursor-down key, leaving zeros in the unused spaces.

You can edit a line with the cursor-up key. It moves the cursor backward on the current line and up to the previous line when the cursor reaches the beginning of the current line. Enter any corrections and press Enter to move on.

When you've finished entering all of the printer commands, the program asks you to confirm that the codes are correct. If they're not, press N to start over again (press Enter to bypass any codes which are already entered correctly). If the codes are correct, press Y to return to the main menu. If an error turns up later, you again can select option E to return to this screen and make corrections.

Many printers for IBM computers and compatibles use the same control codes as Epson printers. If you can't find your printer manual or you aren't sure about the codes for your printer, the Epson codes are a good starting point. Here are the Epson codes to enter on each line:

8 lines per inch: 27,49
6 lines per inch: 27,50
Condensed (16.7 cpi): 15
Regular (10 cpi): 18

If your printer doesn't operate correctly with these codes, look up the correct codes in your printer manual.

If your printer can't produce condensed type or any of the other options, just leave that line blank. You will, however, need a wide-carriage printer to make printouts if your printer doesn't support condensed type. We'll discuss this further below.

More Menu Options

Once you've set up *Quick Scheduler* as described above, you're ready to use the program. Unless you want to change the printer settings or start a new year, you won't use the E or I options again.

Here are the remaining menu options and brief explanations:

W) Work on Calendar. This takes you to a screen where you can enter information for any date.

O) Onscreen Summary. This displays the entire year at a glance, showing you all of the dates which have either holidays or notes you have entered.

P) Print Wall Planner. This prints copies of your calendar. You can print either a single month's calendar page, a range of months, or the entire year.

X) Exit to DOS. This returns you to the DOS prompt. Be sure to save any data you've entered into the calendar by pressing F10 before you leave the calendar-page screen. There is no save option on this menu.

Let's look at these functions one at a time, starting with the W option. This is the option you'll probably use most to check the information for a date, enter new appointments, or add other information to your calendar. The remaining options are discussed later.

Working on the Calendar

When you press W, a new screen appears and displays eight date blocks. A command bar at the bottom of the screen displays commands used in *Quick Scheduler.*

When you first move to this work screen, *Quick Scheduler* always displays the calendar entry for today's date (assuming the system date is correct, of course). You'll find it in the second block on the top row, where you see a flashing cursor. To the left, you'll see the previous day, and to the right are blocks for the two days following today.

The second row of blocks shows the following month and the same dates. For example, if January is on the top row, the same dates in February are shown on the second row. To move both rows forward one month, press PgDn. To work on the month before, press PgUp. However, you can't move backward past January to the December of the previous year, or forward from December of this year to January of the next. If you attempt to do this, the computer beeps.

To enter appointments or other information, simply start typing. When you've filled one row, press Enter to go onto the next line. You can also move to another line with the cursor keys. *Quick Scheduler* doesn't automatically wrap from line to line like a word processor, so you must use these keys to move from one line to the next.

The Del and Backspace keys perform their usual editing functions. *Quick Scheduler* always operates in overtype mode, so any character you type will replace an existing one in the same position on the screen.

You can delete everything on the current line by pressing F1. If you want to clear the entire date block, press F3.

To save your entry, press F10. Do this each time you enter something for a date or when you have entered all the information for that session. Moving to another date automatically saves anything previously entered, but be sure to press F10 when you complete your work on the calendar to ensure that nothing is left unsaved. The program doesn't actually save the information on disk until you exit this screen, so don't be concerned if you don't hear the drive whir every time you press F10.

Going to Another Date

Quick Scheduler always begins at the current date, but you can move from date to date within the program. To move forward one day at a time, hold down the Ctrl key while pressing the cursor-right key. To move back one day at a time, hold down Ctrl while pressing the cursor-left key.

Note that the cursor remains in the same box, but the dates change. You can't use this method to move from the current month to the previous month or to the next month, but *Quick Scheduler* provides another way to do this.

When you want to jump to another month or move further than one day at a time, press F2. *Quick Scheduler* prompts you for a date within the current year. Enter the date numerically, with leading zeros for single-digit dates.

For example, enter March 15 as 0315, with no spaces or other characters. Press Enter, and you'll see the date you selected in the working box. Then type your entry for that date.

Duplicating Entries

Occasionally, you'll want to insert the same information for several dates. For instance, let's say your bowling night is every other Tuesday. To make it easier to enter this kind of repetitive data, *Quick Scheduler* provides a template.

To create a template, hold down the Ctrl key and press E. When the blank template appears, enter your information. You could create a template containing the word *Vacation* to mark several days. Just fill out the template block. When you're finished, press F10 to store the template information.

Now, when you want to insert your template information on the working block in the calendar, just hold down the Ctrl key and press A. The information in the template is transferred to the working date block.

Quick Scheduler maintains these templates only during the current working session. When you exit the program, any data in the template is lost. But if you entered it into a date block, it remains in that block.

After you've finished working with the calendar, you can return to the main menu by pressing Esc. If you've changed the calendar, though, remember to save your work by pressing the F10 key before returning to the menu.

Printing a Calendar

The Onscreen Summary option on the main menu reveals the entire year at a glance. When you you select this option by pressing O, a grid appears, showing the months in separate rows. At the top of the screen are the numbers of the month's days. (Notice that the beginning digits of days numbered 10 and higher are omitted to save screen space.) Each date is a block in the grid. Dates containing entries or holidays are marked with an X. This feature lets you check a date quickly without going to the work screen.

To print a hardcopy of a calendar, select the Print Wall Planner option. (Make sure you've entered the appropriate printer codes as described earlier.) Printed calendars contain all of the information you've entered. If you have a schedule or itinerary you'd like to share with others, use this option to make extra copies. Printouts are also handy to take with you or to post on a bulletin board.

When you select the printing option by pressing P, *Quick Scheduler* prompts you for the beginning and ending months to appear in the printed output. Enter the months numerically, adding leading zeros to months with single digits. For example, enter July as 07. To print a range of months, type the number of the first month and press Enter; then type the number of the last month. For instance, to print calendars for all the months between February and July, inclusive, type 02 and 07. To print the calendar for a single month, enter the same number on both lines.

After you enter the second number, *Quick Scheduler* asks whether you want to print in condensed type. Type Y for condensed or N for full-sized type. If your printer doesn't support condensed type, respond with N. Next, *Quick Scheduler* reminds you to turn on your printer. Pressing any key starts printing.

If you choose condensed mode, the printout is centered on standard 8½-inch-wide paper. Each month appears on a separate page. When positioning your paper, allow about a 1-inch margin above the printhead for best appearance.

If you choose regular printing, the printout requires paper 14 inches wide and 11 inches long. This means you need a wide-carriage printer which can handle this paper size. Otherwise, the printout will be chaotic. In most cases, the condensed mode is preferred, since it doesn't require special paper or a wide printer.

Special Notes

The data file YEAR.DAT created by *Quick Scheduler* contains information for only one year. If you want to maintain calendars and schedules for several different years, you must keep a copy of *Quick Scheduler* and its related data file on a separate disk or in a different subdirectory for each year. *Quick Scheduler* can't differentiate between data files initialized for different years, since all are called YEAR.DAT.

Quick Scheduler also won't insert holidays into years other than the current year, even though it asks whether you want the holidays inserted. For instance, it won't enter Christmas in the slot for December 25, 1995 unless you change the system date to 1995. However, if you want to know on which day of the week Christmas falls in some future year, it will calculate that for you.

To print a calendar correctly, remember that your printer must be able to print the IBM character set. Many printers have the ability to print more than one character set. DIP switches on these printers determine which character set is active. If you experience difficulty, first be sure that you've entered the correct printer codes using the E option on the main menu. Then see your printer manual for the correct IBM switch settings.

A Note About Shareware

When you run *Quick Scheduler*, you'll see a request for a donation of $10 on the main menu screen. Like most of the programs used in "Best of the Boards," *Quick Scheduler* is a shareware program which is supported by its users. The author of *Quick Scheduler* requests a voluntary donation which goes entirely to him, not to *COMPUTE!'s PC Magazine*.

If you use *Quick Scheduler* regularly, you may choose to honor the author's shareware request and become a registered user. If so, the author promises to inform you of new versions of *Quick Scheduler* and to make them available to you at low cost.

COMPUTE!'s PC Magazine provides these programs for the use of our readers. These programs are normally distributed with documentation files which are not included on the magazine disk. Please do not distribute *Quick Scheduler* to others, since important documentation would be missing.

Programs for "Best of the Boards"

COMPUTE!'s PC Magazine is always on the lookout for public domain and shareware programs to publish in this column. If you have written a public domain or shareware program which you feel would be useful to our readers, we'd like to see it.

Programs should be of interest to a majority of our readers. We're especially looking for applications software and general DOS utilities. Naturally, all programs need to be bug-free and easy to use.

If you feel your program fits those specifications, send it on a 5¼-inch floppy disk, complete with documentation, to the address below. Be sure to include your name, address, and a daytime phone number, and use a disk mailer to prevent damage.

Disks will be returned only if you include a self-addressed, stamped disk mailer. All submissions will be acknowledged, and we'll contact authors of those to be used in "Best of the Boards." Submit programs to:

George Campbell
1472 Sixth St.
Los Osos, CA 93402

PC

GETTING DOWN TO BUSINESS

Advanced Spreadsheets

The most popular electronic spreadsheets, such as *Lotus 1-2-3, VP Planner, Multiplan,* and others, have solidly established their value for millions of computer users. But if you're like many people who find these products too limited, slow, or lacking in features, maybe it's time to take a look at the more powerful financial modeling and calculation packages now available. Although these programs are powerful, they aren't as difficult to use as you might think. They are helping average, relatively unskilled users build very large and sophisticated models for the first time.

Disk-Based Data Storage

One of the major advantages of the new generation of financial packages—including such products as *FCS* from Thorn/EMI and *Javelin* from Javelin Software—is that they manipulate data from disk-based files rather than in the computer's memory, the way conventional spreadsheets do. Among other things, this approach frees large amounts of precious memory from the simple task of temporary data storage, leaving more room in the program for powerful features.

Robert A. Moskowitz

For example, one of the most common requirements for business calculations is to "consolidate," to collect the values from a series of spreadsheets into one summary spreadsheet. With programs like *Lotus 1-2-3,* you must remember to build the various spreadsheets consistently or manually execute a complicated series of commands to extract the data you want to consolidate from various spreadsheets. In addition, consolidating 12 monthly spreadsheets or the monthly results of many separate operating units may be out of the question because of the large amount of memory required.

But today's more advanced financial packages generally have very powerful consolidation features built in. You can issue a single command and let the computer extract the data from various spreadsheets, compute the summaries or totals, and display them in any format you want.

Another advantage of disk-based data storage, as opposed to storing data in spreadsheet cells in the computer's main memory, is that you need to enter the data only once. You can then use the data over and over again in many different contexts, confident that it is consistently accurate, even across different spreadsheets. This approach greatly simplifies your work when updating and revising financial models as data and situations change.

The new packages also make it more feasible to work with very large data files, because you can load into memory just the data you need for any given model or series of computations.

Beyond Macros

Although these software packages are more powerful, you'll probably find them no more difficult to use. You can even set up the displays to look exactly like a *Lotus 1-2-3* matrix if you want. But when you need a different view, you can reshape the data as a list, a graphic, a table, or even a custom-designed form. These adjustments require only a few keystrokes.

Many of these packages are delivered complete with their own programming languages, too. If you've used *1-2-3* or any of its clones, you know that it allows you to do some rudimentary programming by writing and later executing a series of macros (or shorthand commands). But there is no contest between the difficulty of working with the cryptic macros offered by most popular spreadsheets and the simplicity and power of a true programming language.

Other powerful features of the advanced modeling and calculation packages include methods to simplify sensitivity studies and to solve for target values. For example, you can issue a single command to create a report showing how a certain output variable or result in a model (like profits) will change as certain input variables (such as price and sales volume) fluctuate. If you use them another way, the new packages will automatically calculate the exact input variables required to achieve whatever mathematical result you establish for the computer model.

These packages tend to have very powerful date, text, financial, and numeric operators, too. They can calculate the number of days

between two dates in a financial statement as easily as the number of dollars between two amounts.

Database and Text Functions

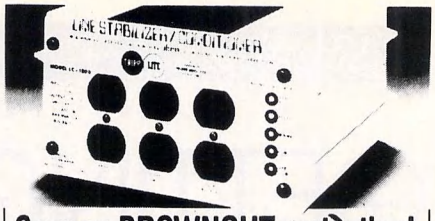
If you build or use complex spreadsheets, you'll also be interested in some of the more advanced debugging features. For example, as you design a spreadsheet, some packages allow you to switch to a flowchart view that shows the relationships between all of the formulas, variables, and other cells. This picture of the underlying logic makes understanding, modifying, and debugging a spreadsheet far easier than ever before.

In addition to duplicating spreadsheet functions, the new packages incorporate some text-handling and database features, too. This means any information in your profit-and-loss statement, for instance, can be queried to immediately answer a question about inventory.

One application that works much better with the advanced packages than with traditional spreadsheets is portfolio management. Spreadsheets asked to store historical data quickly run out of memory, while the new packages generally do not. In addition, you can quickly create a query to see the performance results on any item in the portfolio, something that is much more difficult with a traditional spreadsheet.

Rather than scan the entire spreadsheet for the most recent performance of selected items, you can simply create a new spreadsheet that pulls the necessary data out of the main file and displays it on the screen—in a format you can easily understand and analyze.

Robert Moskowitz is a business consultant based in Woodland Hills, California. Address mail c/o COMPUTE!'s PC Magazine, *P.O. Box 5406, Greensboro, NC 27403.* **PC**



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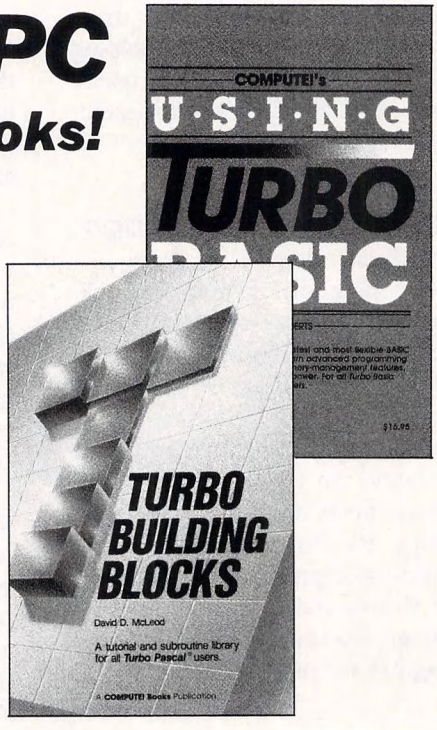

COMPUTE!'s Using *Turbo BASIC* **$16.95**
Ralph Roberts ISBN 0-87455-119-6
The long-awaited *Turbo BASIC* is a powerful and flexible programming tool and *COMPUTE!'s Using* Turbo BASIC shows you how to quickly take advantage of every aspect of *Turbo BASIC*. Bestselling author Ralph Roberts *(Analysis with Reflex)* has included scores of programming examples that illustrate how to capitalize on the potential of your IBM PC or compatible using this impressive new BASIC compiler. A companion disk is available for $12.95 which includes all the programs in the book.

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Source Code XREF

Robert L. Carr

Our September 1987 issue presented a cross-reference utility for BASIC programmers; now we have one that works with Pascal, Modula-2, C, BASIC, or any language that saves source code as an ASCII text file. It lists all identifiers in a program and the source code lines where they occur. The utility runs on any IBM PC, XT, AT, or compatible with at least 256K of memory and DOS 2.0 or higher.

If you're debugging or modifying a program, it's helpful to have a list of all the identifiers plus their locations in the source code. This becomes particularly important when programs grow large and complex. "Source Code XREF" makes this job a lot easier.

For example, the cross-reference listing generated by Source Code XREF can be especially useful in detecting misspelled identifiers. A misspelled identifier makes the compiler think there are two discrete identifiers where you intended to include just one. Source Code XREF's complete list of identifiers helps you spot these mistakes, because a quick scan of the output tells you if your source code is concealing an identifier that you didn't mean to include.

XREF also makes it easy to locate any identifier in a large source code file, because the list it generates includes line numbers. Although many higher-level languages such as Borland International's *Turbo Pascal* don't use line numbers the same way BASIC does, some text editors can display line numbers in source code files, and many allow you to jump directly to any line. This makes it a snap to identify trouble spots and enter corrections.

Running the Program

You'll find Source Code XREF on the magazine disk in a file called XREF.COM. To run it, you need an IBM PC, XT, AT, or compatible with at least 256K of memory and DOS 2.0 or higher. It works on monochrome or color systems. You can use it with any language—including Modula-2, Pascal, C, and BASIC—as long as the source code is saved in ASCII (plain-text) format.

To run the program, enter the following command at the DOS prompt:

```
XREF
```

When the program loads, you'll see a screen inviting you to enter the name of the source file to cross-reference. Simply enter the filename; if the file is on a different disk or in another directory, enter the path. Note that this file must be in ASCII (plain-text) format. It can't be an executable program which has already been compiled, or a BASIC program saved in tokenized form.

XREF allows you to send the cross-reference listing to a disk file, the screen, or the printer. To make the choice, press D, S, or P.

If you choose to send output to a disk file, XREF prompts you for a filename for the output. You may enter any legal filename.

XREF Listings

As XREF goes through its paces, it keeps you aware of what's going on. It indicates which line it's currently reading, which file it's reading, and where the output is going. You may be surprised at how quickly XREF evaluates a program. It can analyze a 600-line program in only 20 or 30 seconds.

The cross-reference listing generated by XREF exhibits the total number of lines read and the total number of identifiers found. Then it lists all lines where it finds identifiers. Following is an alphabetical list of the identifiers and the line numbers on which they are located.

When XREF finishes the report, it pauses. Press any key to return to DOS. If you want to cross-reference another file, rerun the program.

How It Works

Source Code XREF reads one line of the source code at a time, picks out each identifier, and stores it along with its line number in a node in a binary search tree. Binary searches are very fast, which explains why the program runs so quickly. When XREF has read the entire source file, it prints the identifiers in alphabetical order together with the line numbers in which they appear.

Source Code XREF was written using Borland International's *Turbo Pascal*. For programmers who wish to study how the program works, the source code for XREF is included on the magazine disk in a file called XREF.PAS. Note that this is not an executable program, and it is not required to use XREF. **PC**

Text File Compare

Duncan Thomson

Here's a handy utility that compares two similar text files and displays any sections which differ between them. Fast and compact, it runs on any IBM PC, PCjr, XT, AT, or compatible with at least 256K of memory and DOS 2.0 or higher.

If you work very often with text files, sooner or later you'll encounter a common problem: How can you tell two similar files apart? Perhaps you're finishing a document that you hope is the final draft. Does it contain everything that exists in earlier drafts? Or maybe you're writing a program, and one version runs but another slightly different version doesn't. Where's the slight difference in the source code that's causing the bug?

What you need is some kind of utility program that compares two text files and ferrets out the differences. Of course, DOS has such a utility, called COMP—but it's not exactly what you'd call informative. COMP tells you that two files are different by printing a cryptic message that looks something like this:

```
Compare Error at OFFSET A1
File 1 = 61
File 2 = 7A
```

which is pretty meaningless to most of us.

A much better solution is to run "DIFF." This handy, easy-to-use program rapidly compares two similar text files and finds any differences. But more than that, it actually *displays* the sections of text that differ, so you can see the differences right on the screen. Anybody can use and understand DIFF.

Running DIFF

You'll find DIFF on this issue's magazine disk in a file called DIFF.EXE. To run it, you must have an IBM PC, PCjr, XT, AT, or compatible with at least 256K of memory and DOS 2.0 or higher. Since DIFF runs in text mode, it works with any type of monitor and video display adapter.

To run the program, enter a command at the DOS prompt using this format:

DIFF *filename1 filename2*

where *filename1* and *filename2* are the names of the two files you want to compare.

Remember that unlike the DOS COMP utility, DIFF is intended for use only with text files—those which are saved on disk with a word processor or text editor. It won't compare executable program files with .COM or .EXE extensions. However, it will compare program *source code* files which are saved in text format.

If you aren't sure whether a certain file is a text file, a good test is to use the DOS TYPE command to display it on the screen. To do this, enter the following line at the DOS prompt:

TYPE *filename*

where *filename* is the name of the file you want to examine. If the computer displays a lot of gibberish, or displays nothing and beeps, the file is most likely not a text file. Text files should appear much as they do when loaded into a word processor.

Be aware that many word processors insert control characters into text for special functions—typefaces, margin settings, and so on. DIFF doesn't object to these characters in the text, but they may appear odd when displayed on the screen with the TYPE command.

The two files you want to compare can be in the current drive and directory, or in another drive or directory. If they aren't in the current drive and directory, tell DIFF where they are by entering the appropriate specifiers on the command line. For example, to compare a file in drive A with a file in a directory called \WORD on drive C, enter:

DIFF A:*filename1* **C:\WORD***filename2*

If you don't enter a specific drive and directory before a filename on the command line, DIFF assumes the file is in the current drive and directory. If DIFF can't find the file in the directory, it displays an error message.

DIFF Reports

If DIFF finds a discrepancy between two files, it displays the text which differs between the files. It also displays the filenames and the number of differences found in the text.

Below is a typical DIFF report as you'd see it on the screen. We compared two short text files named FILE1 and FILE2:

```
****************************************
File "FILE1" contains:
  THIS IS A TEST
----------------------
File "FILE2" contains:
  this is a test
****************************************
There were 1 difference sections
```

Notice that DIFF is case-sensitive; it distinguishes between upper- and lowercase letters when comparing text.

DIFF is a smart program—it does more than a simple line-by-line comparison. It starts by comparing the files line by line until it finds a mismatch. If it finds a mismatch, it searches ahead through both files until it finds the next point at which the files match up again. Then it displays the section which differs.

For example, suppose one file includes the following lines:

```
Dear Mom,
How are things in Waxahatchee?
Things are fine here!
It's spring, and even the daffodils are blooming.
```

And another file includes the following:

```
Dear Mom,
How are things in Waxahatchee?
Things are great here!
It's spring, and even the daffodils are blooming.
```

The first two lines are identical, but the third line is different. DIFF compares these files line by line. When it finds a line that's different, it searches ahead in both files until it finds a line which is the same—the last line, in this case. Then it displays whatever lines are different in the two files. It reports:

```
Things are fine here!
```

and

```
Things are great here!
```

Then it continues with a line-by-line comparison from the point where the files again match.

To DIFF, a line is a series of characters ending with a carriage return, not a period or other punctuation. Most text editors automatically end every line as you see it on the screen with a carriage return. Some word processors do this, too. But others may insert a carriage return only at the end of an entire paragraph. If the lines reported by DIFF seem long, this is the explanation.

Wait—There's More

If DIFF could do nothing else than what we've covered so far, it still would be a highly useful utility. But DIFF also has extra options for extra versatility. You enter these options on the command line following the names of the files you want DIFF to compare. Here is the complete DIFF command-line syntax, options included:

DIFF *filename1 filename2* **/NUMBERS /CONTEXT /BARS**

When you enter an option, precede it with a forward slash character (/). You can type the options in either lower- or uppercase letters. You can't, however, use two or more options together; use only one at a time. If you try to use more than one option at once, DIFF recognizes only the first option on the command line. It ignores the others.

If you forget the names of these options and this magazine article isn't handy, DIFF can display a help screen to remind you of the correct protocol. To get help, simply enter the command DIFF by itself at the DOS prompt. Don't follow it with anything. A short help screen will instantly appear.

Now let's see what the options do.

DIFF Options

The /NUMBERS option instructs DIFF to add line numbers to the lines of text it displays on the screen. DIFF doesn't alter the text file itself in any way—the line numbers appear only on the screen for reference purposes.

This option is especially useful for programmers. Many text editors designed for writing source code have a command that jumps to a particular line in a file. Using the /NUMBERS option, programmers can find the place to jump to fix trouble spots in the source code.

To compare two files with the /NUMBERS option, enter:

DIFF *filename1 filename2* **/NUMBERS**

Following is an example of a DIFF report with line numbers included. Again, we compared two short files named FILE1 and FILE2:

```
****************************************
File "FILE1" contains:
  1: THIS IS A TEST
----------------------
File "FILE2" contains:
  1: this is a test
****************************************
There were 1 difference sections
```

The /CONTEXT option displays the differences between the two files as described above, but it also displays the line *following* the lines that differ. Some-

times it's easier to examine the differences when they're displayed in context.

To run DIFF with the /CONTEXT option, enter the following on the command line:

DIFF *filename1 filename2* **/CONTEXT**

Here's a DIFF report using the /CONTEXT option:

```
****************************************
File "FILE1" contains:
  THIS IS A TEST
  This line is the same.
----------
File "FILE2" contains:
  this is a test
  This line is the same.
****************************************
There were 1 difference sections
```

The final option is /BARS. This option displays all of the text in the first file. DIFF marks with a vertical bar character (|) any line in this file that differs from the corresponding line in the second file. DIFF uses the bar character because it's seldom used anywhere but on the DOS command line. You'll find it on most keyboards above the backslash character (\ ).

To run DIFF with the /BARS option, enter:

DIFF *filename1 filename2* **/BARS**

You'll see the vertical bars which mark differing text at the beginning of the line on the extreme left.

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Using DIFF with DOS Redirection

DIFF normally sends its output to the screen. But you can also use the DOS redirection symbols > and | to send DIFF reports elsewhere. Here's how.

If you find that DIFF's output scrolls too rapidly on the screen to be readable, you can send the output to a third text file. To do this, enter:

DIFF *filename1 filename2* **>** *outfile*

where *outfile* is the filename of the text file which is to contain the DIFF report. All DIFF reports then go to *outfile* instead of to the screen. Later, you can load the output file into your word processor and examine it more easily.

You can also use the DOS MORE filter with DIFF. To do this, enter the following:

DIFF *filename1 filename2* **| MORE**

Important: Don't forget to include the vertical bar (|) symbol as shown.

The MORE filter displays the DIFF report one screen at a time. To advance to the next screen, press any key. To abort the DIFF report, hold down the Ctrl key and press C.

MORE is a utility you'll find on your DOS master disk. It must be in the current drive and directory together with DIFF, or you must have previously defined a path to its location with the PATH command. See your DOS manual for further information on the MORE filter.

You can even combine DOS redirection with DIFF options. For example, you can use the /BARS option and send output to a text file:

DIFF *filename1 filename2* **/BARS >** *outfile*

Then you can load the output file into your word processor and use its search feature to find all of the vertical bar symbols DIFF inserted.

For more information about DOS redirection and filters, consult your DOS manual.

Final Notes

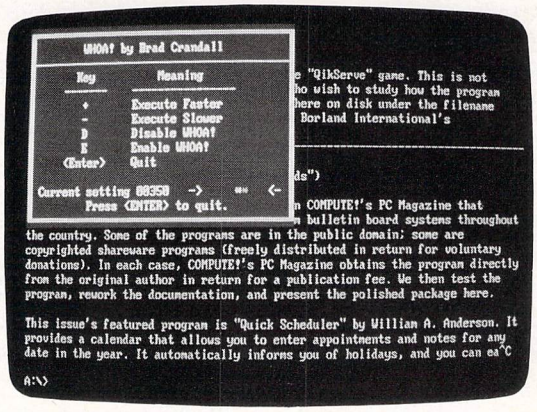
Programmers who want to know how DIFF works can find the program's source code on the magazine disk in a file called DIFF.C. (This is not an executable program file, and DIFF does not require it to run.) DIFF is written in C, and it conforms closely to the current draft ANSI standard for C. It was compiled and linked with Borland International's *Turbo C*, but it should compile on any C compiler which supports the draft ANSI standard. In particular, the compiler must support function prototypes. Older compilers may not support this feature.

Programmers may find the use of linked lists as well as other data structures and algorithms interesting. **PC**

WHOA!

Brad Crandall

Did you ever think the time would come when you'd want to slow down a computer? Well here's a pop-up utility that does just that. If you have a superfast AT, AT compatible, or PS/2, you can slow it down to run your favorite games and other time-critical programs at a manageable speed. If you don't have a computer that's too fast, you may want to handicap the machine to gain an advantage when playing certain games. "WHOA!" runs on any IBM PC, XT, AT, PS/2, or compatible with at least 256K of memory and DOS 2.0 or higher. It is not compatible with the IBM PCjr or with the advanced screen modes of the enhanced graphics adapter (EGA).


WHOA! by Brad Crandall
Key
Meaning
+
Execute Faster
-
Execute Slower
D
Disable WHOA!
E
Enable WHOA!
<Enter>
Quit
Current setting 08350
Press <ENTER> to quit.
"QikServe" game. This is not
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here on disk under the filename
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n COMPUTE!'s PC Magazine that
n bulletin board systems throughout
the country. Some of the programs are in the public domain; some are
copyrighted shareware programs (freely distributed in return for voluntary
donations). In each case, COMPUTE!'s PC Magazine obtains the program directly
from the original author in return for a publication fee. We then test the
program, rework the documentation, and present the polished package here.
This issue's featured program is "Quick Scheduler" by William A. Anderson. It
provides a calendar that allows you to enter appointments and notes for any
date in the year. It automatically informs you of holidays, and you can ea^C
A:\>

"WHOA!" lets you change a computer's speed from within DOS or virtually any application program.

If you've moved up to an IBM PC AT, AT compatible, or PS/2, you're probably astounded by how fast it is. It retrieves data from the hard drive with a brief rumble, calculates spreadsheets in a wink, and compiles the program you're writing in seconds.

But when work is over, it's a sad discovery that the speed which is so wonderful when processing data becomes a liability when you want to play an arcade-style game. Spaceships fly across the screen at nearly the speed of light and you don't have a chance to shoot them down. The goblins in the maze gobble and digest your hero before there's time to unsheath his sword. And you find it impossible to avoid crack-ups when taking to the skies with your favorite flight simulator. You begin to wish you had kept the old slow computer around just for games.

"WHOA!" is a better solution. You can slow down your computer when you want it slow. You can speed it up when you want it fast. With WHOA!, it's easy to fine-tune the speed of your computer until it's just right. WHOA! even has a speedometer.

If you're not a fan of arcade games, WHOA! can solve some problems for you, too. It allows programmers with fast computers to emulate the speed of a slower PC so they can see how well their programs run on the machines that most people still use. It also lets you switch into slow motion to scrutinize, debug, and optimize code that involves screen output. For fun, use WHOA! to watch a slow-motion version of one of the sharp-looking demos or logo routines that come with some software products—it's fascinating!

In fact, WHOA! can be used to slow down practically any program for practically any purpose. Even the fastest program running on a superfast computer can be harnessed to move at a crawl.

How to Install WHOA!

You'll find WHOA! on this issue's magazine disk in a file called WHOA!.COM. It's a memory-resident program, which means that after you install it, WHOA! remains in the computer's memory until you reboot the

computer. Once installed, WHOA! waits for the special keypress that activates it. In the meantime, you can run other programs and use the computer normally.

To install WHOA!, put your backup copy of the magazine disk in the current drive and enter the following command at the DOS prompt:

```
WHOA!
```

Another way to install it is to enter WHOA! followed by a space and a number. The number represents the speed at which you want the computer to run. The number can be any number between 1 and 435. The *higher* the number, the *slower* the computer runs. For example,

```
WHOA! 200
```

If you install the program by typing WHOA! at the DOS prompt without a number, it defaults to a speed of 350.

Of course, you can also install WHOA! automatically during bootup by including it as a line in your AUTOEXEC.BAT file. See your DOS manual or "Getting Started with Batch Files" in the November 1987 issue for more details.

When WHOA! is properly installed, it displays a message on the screen to notify you that it has become memory-resident.

Calling WHOA!

You don't have to set WHOA!'s speed when you install it, and you're not stuck with that speed if you do. WHOA! has a convenient pop-up menu box that can be summoned from DOS or from within most application programs.

To call WHOA!, hold down the Alt key and press the F10 key. The menu box pops up and allows you to change the computer's speed, turn off WHOA!, or turn it back on again. The menu box also displays the number of the current speed setting and a speedometer. (See photo.)

Since WHOA! is memory-resident, you can call it while you're playing a game, writing a letter with your word processor, or running almost any other software; simply press Alt-F10. When you want to exit the menu box and resume the task at hand, press Enter. It's that simple.

The number in the menu box indicates the speed at which the computer is running. You can decrease or increase this value by pressing the plus (+) or minus keys (−), respectively. Remember that 1, the minimum value, indicates the fastest speed, and 435, the maximum value, indicates the slowest speed. Therefore, the plus key *decreases* the value and *increases* the speed, while the minus key *increases* the value and *decreases* the speed. You can use the plus and minus keys on the regular keyboard or those on the numeric keypad.

The asterisk character (*) bouncing back and forth between the arrows is a speedometer that provides a visual representation of the computer's speed. When the speed is increased, the asterisk moves faster. When the speed is decreased, the asterisk moves slower.

Yet another way to change the speed is to enter the speed number at the DOS prompt as a command, just as if you were installing WHOA!. To change the speed to 240, for example, enter

```
WHOA! 240
```

If WHOA! is already installed, it recognizes this as a speed command and won't install itself in memory twice.

Turning Off WHOA!

You can turn off WHOA! temporarily, or, if you wish, permanently. You may want to turn it off temporarily when using software that profits from your computer's speed, such as your word processor. You may also want to turn it off when saving files on disk. (No disk problems were encountered with WHOA! during testing; nevertheless, some computers may be sensitive to speed changes during input/output operations, so it's wise to play it safe.)

To temporarily disable WHOA!, open the menu box with Alt-F10. Then, press D for Disable. Notice that the bouncing asterisk disappears. This indicates that WHOA! is disabled and is no longer slowing down the computer. Press Enter to exit the menu box.

To turn WHOA! back on, press Alt-F10 to display the pop-up menu; then press E for Enable. You'll notice that the bouncing asterisk reappears, and the speed value in effect when WHOA! was disabled remains unchanged. Press Enter to exit the menu box.

You can also turn off WHOA! permanently. You'll probably want to do this if you're running a program that uses the Alt-F10 combination for its own purposes. When you disable WHOA! permanently, it restores normal use of the Alt-F10 combination and returns the computer speed to normal.

To un-install WHOA!, just enter WHOA! by itself at the DOS prompt. Don't follow it with a speed parameter. WHOA! notifies you that it is un-installed.

Note, however, that un-installing WHOA! doesn't free up the memory it was using. Unfortunately, DOS doesn't provide a way to reuse memory that was previously allocated to a memory-resident program. This isn't a major handicap, though, because WHOA! consumes very little memory.

Special Notes

Memory-resident programs such as WHOA! provide useful services, many of which couldn't be provided any other way. However, DOS is not really designed to handle the many special uses to which memory-resident programs are put, and because of this, conflicts sometimes exist between memory-resident utilities and application programs, or between memory-resident programs themselves when more than one are installed at the same time.

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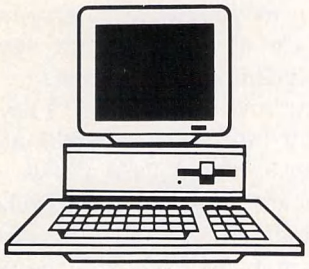

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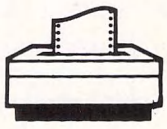

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To avoid problems, you should test WHOA! with your application software and any other memory-resident programs you use before doing any important work. It is wise to take this precaution when using any new memory-resident program on your system for the first time.

Technical Information

For programmers interested in how the program works, the source code for WHOA! is included on the magazine disk in a file called WHOA!.ASM. WHOA! is written completely in machine (assembly) language.

WHOA! uses interrupts 08h (the BIOS timer interrupt), 16h (the BIOS keyboard interrupt), and 2Fh (DOS's multiplex interrupt). WHOA! works by inserting a delay loop into interrupt 08h. Interrupt 08h is responsible for updating the PC's clock every 1/18 second. Because WHOA! inserts a delay loop, the interrupt 08h routine takes longer to return control to the application, and the computer slows down.

WHOA! doesn't interfere with normal date and time maintenance because the delay loop is completed before the next interrupt occurs 1/18 second later. This helps make WHOA! completely invisible to most applications.

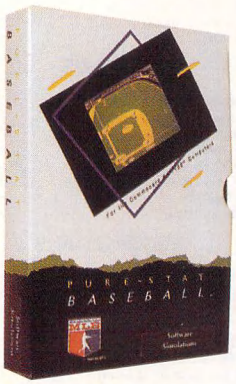
Programmers who wish to modify WHOA! should use care if they change the value of SET_MAX, which is located in the equates area of the source code. SET_MAX is the maximum value that can be entered for the computer speed. The value 435 is optimum for a 12-megahertz machine, but slower machines may need a slightly lower value. If the maximum value is too large, it may result in a delay loop which can't finish before the occurrence of the next timer interrupt. This can lock up the computer.

WHOA! intercepts interrupt 16h (the BIOS keyboard interrupt) to watch for the hot-key combination that triggers WHOA!'s pop-up menu. This allows WHOA! to intercept keyboard input before it reaches an application. Since virtually all programs use interrupt 16h to receive input from the keyboard, the pop-up menu can be displayed from within other programs as well as from DOS.

Interrupt 2Fh is DOS's multiplex interrupt. The primary purpose of this interrupt is to provide a common place for other programs to communicate to terminate-and-stay-resident programs (TSRs). A unique handle is used to identify the TSR to which communication will occur. WHOA! uses the 2Fh interrupt to communicate with its memory-resident routines. The DOS PRINT and SHARE utilities are examples of other TSRs that use this interrupt.

With the variety of display modes available today, special care has been taken to ensure that all screens (except advanced EGA modes) are restored to their prior state after WHOA!'s pop-up menu is closed.

When WHOA! is un-installed, the interrupt vectors it uses are also restored to their original state. **PC**



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PURE-STAT BASEBALL is a complete statistical baseball simulation for zero, one or two players, that also includes a built-in STAT COMPILER and a program to TRADE PLAYERS. GAME PLAY, MANAGER'S DECISIONS, GRAPHICS and a complete statistical library establish PURE-STAT BASEBALL as the ULTIMATE SPORTS SIMULATION program. PURE-STAT BASEBALL's underlying statistical framework simulates the realities of baseball like never before. Within this framework the program considers each PLAYER'S BATTING STATISTICS AGAINST both LEFT and RIGHTHANDED PITCHERS, along with the graphics and attributes of every MAJOR LEAGUE STADIUM from the optional STADIUM DISK. Every PLAYER'S FIELDING, BASERUNNING and THROWING ABILITIES are also considered. Optional TEAM DISKS are available.

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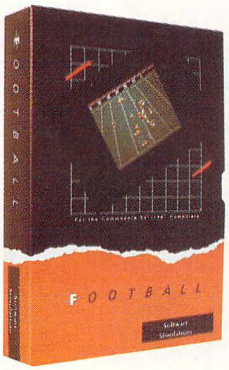

FOOTBALL

FOOTBALL simulates all physical aspects of the game of football down to the finest detail, while you are controlling the movement of key players on the field. For one or two players FOOTBALL sets new standards in both REALISM and PLAYABILITY using an overhead 3D perspective of the football field giving full view of all 22 animated players. Every offensive receiver and running back has different individual physical attributes (SPEED, POWER, AND CATCHING ABILITY). Each player's performance characteristics help you determine how and when to use that player most effectively. Each quarterback has unique abilities for SHORT, LONG or FLAT PASSES, and linebackers have power ratings for tackling ability.

Retail price: $29.95
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PURE-STAT COLLEGE BASKETBALL

PURE-STAT COLLEGE BASKETBALL is a complete statistical basketball simulation for zero, one or two players, that also includes a STAT COMPILER. The game uses coaching strategy and player statistics to determine the outcome of each play, while graphically depicting the sequence with 10 animated players on a basketball court. The game comes with 20 all time great college teams from past and present, and with an optional CREATE TEAM DISK the statistics for any college team from any division can be entered.

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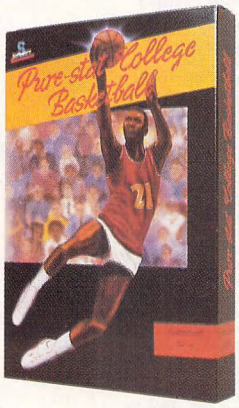

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BREACH

"I was moving a squad of four of my best through the *kehst*-beridden jungles of Kiskismok, when suddenly Darrow's detector picks up what looks like a couple of life forms 50 meters out."

"'Nothin' but a couple of those brachiators,' he says to me. Just then Darrow takes it through the chest."

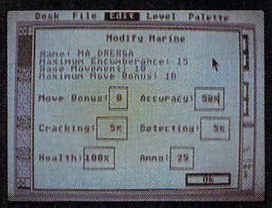
"We all drop into the mud, flipping through our helmet displays trying to find out where the shot came from when I hear this rumbling. More like I *feel* this rumbling. An' then there it is. A battle robot."

"Hsiang shoots the thing in its sensory grid with a bolt, but it doesn't do much good 'cause he's a psionic talent and they don't give 'em half-way decent guns. It starts tracking him with its dual guns and suddenly he takes some hot plasma too. Now it's just me and the kid, Yamaguchi."

"'Guchi,' I said, 'Direct your fire into the lifters so it can't move. These things are pretty lousy about protecting their undersides.' So like he was a vet of 20 drops, he rises to one knee and hits the thing right in the lifters. And then he does it twice more."

"'One battle robot: out of action,' he says. I toss an energy grenade at the hulk just to make sure and then we start the long job of carrying the boys north, where we know the landing boat'll be."

The Serayachi Campaign—Sgt. Robert Sherwood, FWSF *Ret.*



Breach is a single-player tactical-level combat game for one person. It features:

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- Macintosh™ version includes digitized sound.
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- Your squad leader is independent of any scenario—play **Breach** just like a role-playing game *or* as a single session wargame.
- Build-up your squad leader for special advanced training—all of his combat experience is saved!
- **Breach** includes a **Scenario Builder**—create your own scenarios or modify existing ones!
- Scenarios can have several different victory conditions which can be mixed together to form extremely complex battles.
- Additional scenario disks available soon!

Breach is available for the Atari ST and Macintosh. IBM version available soon. Photos are for the Atari ST version.

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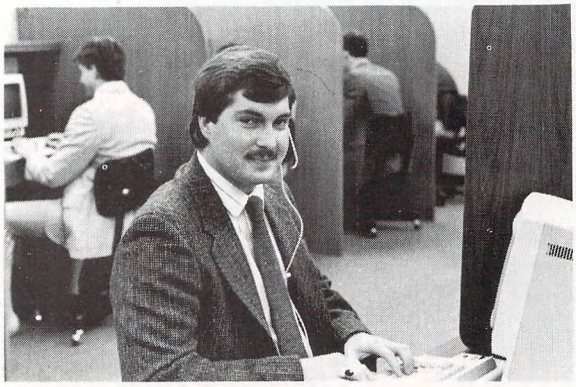

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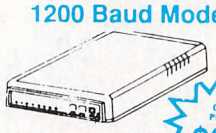

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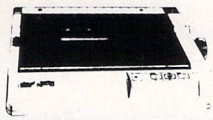

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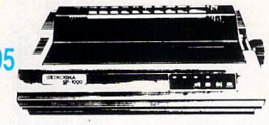

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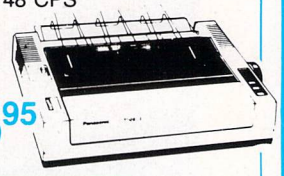

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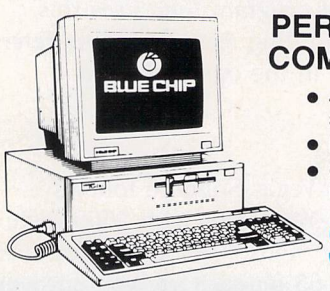

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Las Vegas Solitaire

Terry Lee

Here's solitaire as your grandmother taught you—if she was a cardsharp in Las Vegas. This game uses text-mode graphics, so it's compatible with both color and monochrome systems. It runs on any IBM PC, PCjr, XT, AT, or compatible with at least 256K of memory and DOS 2.0 or higher.

Maybe you'd like to take a get-away trip to Las Vegas, but it just doesn't seem to be in the cards. Well, here's an alternative: "Las Vegas Solitaire." It's the traditional game of solitaire played by Las Vegas rules, and the cards are definitely stacked against you. But when you win, you win big.

Las Vegas Solitaire even has an autoplay feature that lets you be the kibitzer while the computer plays the cards. Or, you can have the computer make the plays you miss. And when the game is over and your money is gone, you won't have to pawn your watch to buy a bus ticket home.

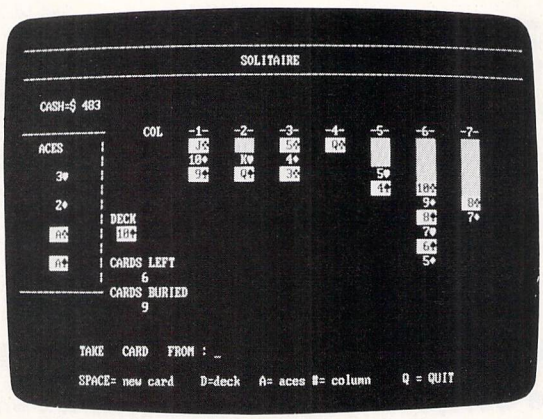
Getting Started

Las Vegas Solitaire runs on any IBM PC, PCjr, XT, AT, or compatible with at least 256K of memory, DOS 2.0 or higher, and a color/graphics adapter (CGA) or monochrome display adapter (MDA). Most PC compatibles have the equivalent of a CGA or MDA board built into their hardware. If your system can display color, Las Vegas Solitaire takes advantage of it. But because its "graphics" are composed of text characters, it also runs on monochrome systems.

You'll find Las Vegas Solitaire on this issue's magazine disk in a file called SOLITAIR.EXE. To run it, enter the following command at the DOS prompt:

SOLITAIR

When the game loads, it displays a title screen that prompts you to press a key to begin. This screen is more than just an introduction to Las Vegas Solitaire; while the screen is visible, the program is counting until you press a key. The program then uses this count to randomize its shuffling routine and to determine which cards appear in the opening hand.



Winning isn't easy in "Las Vegas Solitaire," but getting there is fun.

Playing by the Rules

As mentioned above, Las Vegas Solitaire follows standard Las Vegas rules. You begin with $500 cash; then, each game, you pay the house a dollar for every card—that's $52. You win $5 for each ace you uncover, and another $5 for each card you play on an ace. The program adds your winnings to the total it displays at

the top left of the screen.

When the game begins, you'll see a card already drawn from the deck. It appears face-up in front of you. You either play this card or draw a new card from the deck by pressing the space bar. Any cards you don't play become buried in the pile. The program keeps track of how many cards are left in the deck and how many are buried in the pile.

Unlike other forms of solitaire, you pass through the deck one card at a time and you go through it only once. When you use the last card in the deck, Las Vegas Solitaire notifies you. You can, however, continue to play cards that have been drawn, as long as you play from the top of the pile. If you press the space bar when you have no cards left, the game ends.

Las Vegas Solitaire deals the cards as they are dealt in standard solitaire. There are seven columns, with each one showing a card face-up at the bottom. One card is turned face-down in the second column, two are face-down in the third, and so on. This pattern continues to the seventh column, which has six cards face-down.

Play the cards as you would in standard solitaire. When you uncover a card in a column, you can play it in any column as long as it's one degree lower and is a different color than the card on which you want to play it. For example, you can play a black two on a red three, and a red queen on a black king. This results in columns whose cards alternate colors and the highest cards are at the top. When there are no more plays or all cards are upturned, the game is over. If you can play all of the cards on the aces, you win $260.

Play aces as you would in standard solitaire. Move any ace you uncover to the special box on the left of the screen. When an ace is moved to this box, you can play cards of the same suit on it—but you must play them in increasing order. For example, on the ace of clubs, play the two of clubs, then the three of clubs, and so on. Remember that you win $5 for each ace and for each card played on it. If there are no plays visible, you can draw a card from the deck by pressing the space bar.

As in standard solitaire, you can move columns of cards as well as individual cards. You must move an entire column of upturned cards—you can't move part of an upturned column and leave the rest where it is. If a column is empty, you can move only a king or a column of cards headed by a king to it.

Making All the Right Moves

To move a card or column of upturned cards, enter its column number; if the card is on the deck pile, enter *D* for Deck. Then enter the destination of the card or column. If you want to move to a column, enter the column number. If you want to send the card to an ace box, enter *A* for Ace. To deal a new card from the deck, press the space bar. But remember—you can go through the deck only once.

Las Vegas Solitaire has a watchful dealer, so if you make any illegal moves, you'll be caught. If you provoke an error message, press any key to enter the play again.

The program notifies you when you draw the last card from the deck. After that happens, the game will end when you press the space bar again, so be sure to make as many plays as you can from the upturned cards. When the game ends, the program turns over any remaining face-down cards.

You can play another game by pressing R for Rerun. If you do run the game again, you'll keep the bankroll you already have. If you press some other key, you return to the DOS prompt. You can also return to the DOS prompt at any other time by pressing Q for Quit.

The Autoplay Feature

Las Vegas Solitaire can also play by itself. Press Z (with the caps lock key off) to enter the autoplay mode; press any other key to end it. (Although the program shows all other commands on the screen, the Z command isn't displayed.)

Because autoplay stops when any key is pressed, you can use it to double check yourself. For instance, let's say you can't see another move to make. You can use the Z command to see if you've overlooked any moves. Just press Z twice very quickly—once to start autoplay and once to stop it. This makes the computer check all possible moves. If it finds a move, it plays the card and then stops. If it doesn't find a move, it turns up the next card and stops.

If you're sure of winning a game, press Z to have the computer finish moving all of the cards from the play area to the aces box for you.

In autoplay mode, the program follows the following steps:

- It determines whether the deck card can be played on the proper ace.
- It determines whether the bottom card can be played on the proper ace.
- It checks every column to see if there are any plays between columns.
- It determines whether the face-up deck card will play on any column.
- If none of the above is possible, it draws a new card from the deck.
- If any step above causes a card to be moved, it starts again at the first step.

Incidentally, you might enjoy watching the autoplay mode after slowing down the computer with "WHOA!," a program found elsewhere in this issue.

Don't be surprised if you don't win a game of Las Vegas Solitaire very often. Las Vegas wasn't built with money that visitors take home with them. But, on the other hand, you may get lucky and leave town in a new car instead of on a bus. **PC**

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States & Capitals

Tim Midkiff, Editorial Programmer

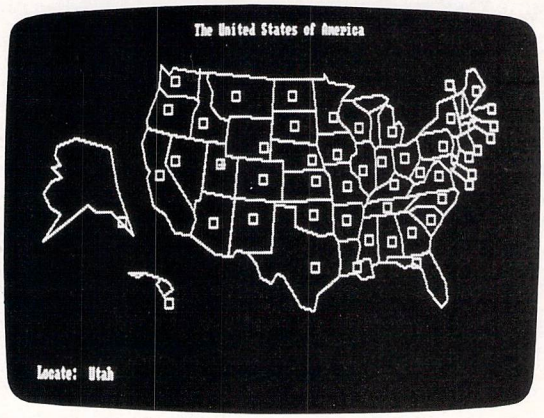
Where is Wyoming? Montpelier is the capital of which state? Youngsters and adults will enjoy brushing up on U.S. geography with this entertaining and educational program. Future installments will help teach foreign geography, too. The program runs on any IBM PC, XT, AT, or compatible with at least 128K of memory, DOS 2.0 or later, and a color/graphics adapter (CGA) or equivalent. It will not work on the IBM PCjr or monochrome-only systems.

Recent newspaper articles have revealed that many Americans, particularly young people, are shockingly ignorant about basic geography. One study found that the majority of college freshmen can't locate Vietnam on a world map, think Nicaragua is an African country, and believe New Mexico is a foreign nation. Another study found that most high school seniors can't match more than five capitals to their respective states.

What makes this particularly puzzling is that geography isn't that difficult to learn. It's basically a matter of studying maps and remembering place names.

Fortunately, geography is an ideal subject for educational software on a computer. A computer is an infinitely patient drill master, and today's PCs have sufficient graphics resolution to display recognizable maps of nations and continents.

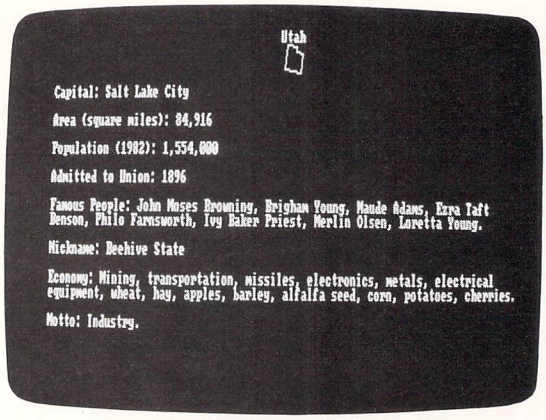
That's why we decided to create "States & Capitals." This educational program displays a map of the contiguous United States, plus Alaska and Hawaii, and can be set up for two kinds of drills. It can either prompt the user to match capitals with states or to locate states on a U.S. map. As the quiz proceeds, it keeps track of the number of hits and misses and calculates a percentage score.



"States & Capitals" is an ideal educational program for youngsters and a good review program for adults who want to brush up on their U.S. geography.

But States & Capitals is more than just an ordinary drill program. At the touch of a key, the user can call up a screenful of information about any of the 50 states. The information screen, compiled with the help of almanacs and encyclopedias, includes such facts and trivia as the state's capital, its population, the year it entered the union, and the state motto. In this way, the program becomes a teaching tool as well as a drill master.

And that's not all. The program underlying States & Capitals is designed to be modular, so it can be adapted to other maps of the world. With the addition of appropriate map files—which will be published in future issues of *COMPUTE's PC Magazine*—the program can teach and drill users on the geography of Europe, Asia, Africa, Central America, South America, or any other region. We also plan to publish a utility program that lets you create your own map files.


Utah
Capital: Salt Lake City
Area (square miles): 84,916
Population (1982): 1,554,000
Admitted to Union: 1896
Famous People: John Moses Browning, Brigham Young, Maude Adams, Ezra Taft Benson, Philo Farnsworth, Ivy Baker Priest, Merlin Olsen, Loretta Young.
Nickname: Beehive State
Economy: Mining, transportation, missiles, electronics, metals, electrical equipment, wheat, hay, apples, barley, alfalfa seed, corn, potatoes, cherries.
Motto: Industry.

Information screens like this can be displayed for any of the 50 states.

Getting Started

States & Capitals is designed to be easy enough for youngsters to use, but you may have to set it up for them at first. You'll find the program on this issue's magazine disk under the filename GEO.COM. Another required file is USA.MAP. The latter file contains graphics data to draw the U.S. map and the text which appears on the information screens. In future issues of *COMPUTE's PC Magazine*, we'll publish additional map files, all of which will end with the filename extension .MAP (for example, AFRICA.MAP or EUROPE.MAP). All of these map files will work with the core program, GEO.COM.

To get started, copy GEO.COM and USA.MAP to a backup floppy disk or a subdirectory on your hard disk. Both files must be on the same disk and in the same directory in order for the program to work. You must also be logged on to that directory when running the program, unless you've previously defined a path to that directory with the DOS PATH command. If you need to know more about directories and paths, refer to this issue's "Readers' Feedback" column or to your DOS manual.

You'll also need an IBM PC, XT, AT, or compatible with at least 128K of memory, DOS 2.0 or later, and a color/graphics adapter (CGA). Some PC compatibles have the equivalent of a CGA board built into their hardware; check your computer manual if you're not sure. The program won't work on systems with monochrome display adapters (MDA) because these video boards lack the necessary circuitry to display true bitmapped graphics, even in black-and-white. It also won't run on the IBM PCjr.

To run States & Capitals, make sure GEO.COM and USA.MAP are both in the current directory. Then enter the following command at the DOS prompt:

```
GEO USA
```

This tells DOS to load GEO.COM and the USA.MAP file. In a few seconds, the U.S. map should appear on the screen.

Beginning a Quiz

At the bottom of the screen is a simple menu offering three options: States, Capitals, and Info (see photo). One of the options will be flashing. By pressing the cursor-left and cursor-right keys, you can move from option to option. Press the Enter key to make your selection.

To start a quiz, pick either the States or the Capitals option. The States option prompts the user to find a particular state on the U.S. map. For instance, it might ask:

```
Locate: Wyoming
```

To indicate an answer, you move the small crosshair cursor to a box within the state and press the Enter key. To move the cursor around the screen, use the cursor keys. As you might expect, the cursor-up, cursor-down, cursor-right, and cursor-left keys move the crosshair in the corresponding directions (north, south, east, and west). You can also move the cursor diagonally by pressing the four remaining keys on the numeric keypad: 7 (northwest), 9 (northeast), 1 (southwest), and 3 (southeast).

In addition, you can make the crosshair cursor move fast or slow. When the Num Lock key is off, the cursor moves slowly. When the Num Lock key is on, or if either Shift key is depressed, the cursor moves quickly. This saves time when moving the cursor across large areas of the map. (The Shift-cursor combination doesn't work on Tandy 1000 computers, due to differences in the Tandy keyboard.)

If you pick the Capitals option from the menu, the program prompts you with the name of a state capital:

```
Locate: Columbus
```

You have to find the correct state. Again, move the crosshair cursor to the appropriate box on the map as described above; then press Enter.

Whether you pick the States or the Capitals option, you must always register your answer by moving the cursor to a selection box within the state. Pointing the cursor elsewhere within the state boundaries won't work. Note that many of the New England and Middle Atlantic states are too small on the map to contain a selection box. The selection boxes for these states are offset from the map and are connected to their respective states with short lines.

The Report Card

As each quiz proceeds, the program keeps track of your score. If you miss a question, the program continues on to the next question. Near the bottom-right corner of the screen, you'll see a record of your guesses and a score expressed as a percentage. For instance, if you've correctly matched two capitals with their states after three queries, the screen indicates *2 of 3 for 66%*.

Both quizzes run through all 50 states or capitals. The quizzes are randomized, so you're always pre-

sented the questions in a different order. It's also an exclusive list, so you're not asked to locate the same state or capital more than once during a quiz.

To be educational, programs should provide a way to find the right answer to a question. States & Capitals allows you to "cheat" and discover the answer by pressing the space bar in response to a question. The program indicates the answer by filling in the proper selection box; this counts as a miss when calculating your score. To continue the quiz, press any key.

At the conclusion of a quiz—after you've been asked to locate all 50 states or capitals—the program fills in the selection boxes of the missed answers and displays the final score. You can then start another quiz or change options.

You can also exit a quiz before all 50 questions have been asked. Just press the Esc key at any time to return to the opening menu. In addition to the regular three options—States, Capitals, and Info—you'll see two more options: Exit and Continue. The Exit option breaks out of the program and returns you to DOS. The Continue option continues the quiz where you left off.

Information Screens

To make States & Capitals an even more useful educational tool, it has built-in information screens for all of the states on the map.

To display an information screen, select the Info option from the menu. (If a quiz is in progress, remember that you can press Esc to reach the menu.) Then move the crosshair cursor to the selection box of any state and press Enter. Instantly, a screenful of information about that state appears (see photo).

You can exit the information screen by pressing any key. This returns you to the map. Pressing Esc while viewing the map returns you to the menu, where you can start a new quiz or exit to DOS. You can't, however, continue a quiz that was in progress.

Programming Notes

States & Capitals was written and compiled with *FTL Modula-2*. Those who are interested in studying how the program works can examine the source code files on the magazine disk: GEO.MOD, GRAPHICS.ASM, and GRAPHICS.DEF. Note that these are nonexecutable files, and they aren't required to use States & Capitals.

GEO.MOD is the Modula-2 source code for the core program, GEO.COM. Future installments of geography programs will be built upon this same core program.

GRAPHICS.ASM is a machine language routine that is linked with the main program. It draws lines and polygons and clears the screen. GRAPHICS.DEF is the definition module for GRAPHICS.ASM. **PC**

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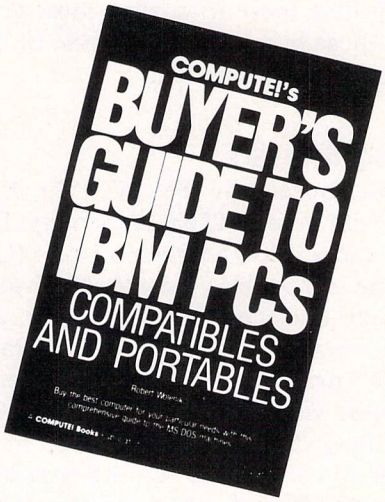

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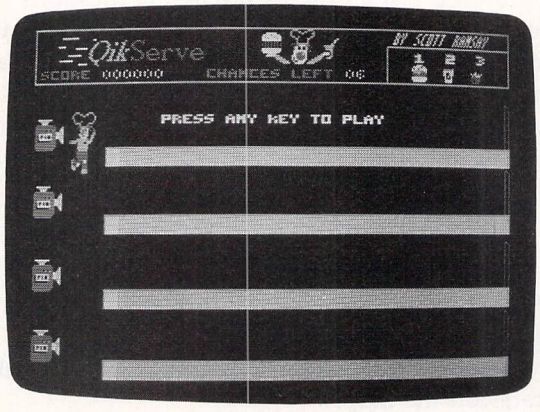
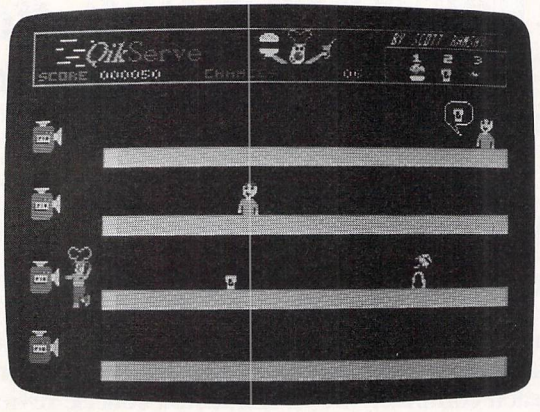
QikServe

Scott D. Ramsay

What's it like to work behind the counter at a fast-food outlet? Here's your chance to find out. "QikServe" is a fast-paced arcade-style game for those who want to try keeping up with all the hungry Joneses in the world. It runs on any IBM PC, PCjr, XT, AT, or compatible with at least 256K of memory, DOS 2.0 or higher, and a color/graphics adapter (CGA) or equivalent hardware. It won't run on systems with monochrome display adapters (MDA).



"QikServe" main game screen: Your battlefield is a fast-food restaurant with counters and food machines.



"QikServe" in action: Hungry customers swarm the counters demanding food.

You've decided to return to college to get a degree in computer science. But we all know scholarships are hard to find these days, and tuition at the Western Nebraska School of Advanced Hacking isn't cheap. Let's face it—you're going to have to find a part-time job.

The service industry is the fastest-growing sector of the economy, and it seems likely that you're headed toward a job in the shadow of the golden arches. Can you fling those fries, sling those shakes, and bounce those burgers with the best of them? Find out with "QikServe."

Getting Started

QikServe runs on any IBM PC, PCjr, XT, AT, or compatible with at least 256K of memory, DOS 2.0 or higher, and a color/graphics adapter (CGA). The PCjr and some compatibles have the equivalent of a CGA board built into their hardware; check your computer manual if you aren't sure. QikServe won't run on systems with monochrome display adapters (MDA) because these video boards lack the necessary circuitry to display QikServe's graphics, even in black-and-white. If you attempt to run the program on a monochrome-only system, you'll receive an error message.

You'll find QikServe on this issue's magazine disk in a file called QIKSERVE.COM. This is the program file, but you must also have two more files in the same drive and directory as QIKSERVE.COM to make the program work. These two files are named QIKSERVE.PIC and QIKSERVE.SHP. When you copy the game to another disk, be sure all three files are in the same drive and directory. Then, log onto that directory before running the program. If you attempt to run QikServe without all three files in the current drive and directory, you'll receive an error message.

To run the program, enter the following command at the DOS prompt:

```
QIKSERVE
```

After the program loads, you'll see a title screen which reminds you that you can quit QikServe at any time by pressing the Esc key. Press any other key to continue.

Life in the Fast (Food) Lane

Here's where you'll earn your salary. As seen in Figure 1, to your right are four counters where the hungry masses come to feed at the noon lunch hour. To your left are four machines that produce the fast food. Each machine produces hamburgers, milk shakes, and french fries, but each machine produces these items only for the adjacent counter—not for the other counters. You appear onscreen as the person with the chef's cap.

As customers arrive, they enter at the right and move up the counter, shouting their orders as they advance toward you. Each customer's order appears as an icon inside a cartoon balloon (Figure 2). There are three different icons which also appear in the upper right corner of the screen. The first is a hamburger; the second, a shake; and the third, a parcel of french fries. What the customer wants, the customer gets—or you'll be in trouble.

Here's how to serve the customers. You can dash from one machine to another by pressing the cursor keys. Press the cursor-up key to run up the screen and the cursor-down key to run down the screen. Be sure the NumLock key is turned off, or the cursor keys won't operate properly.

Notice that when you pass a food machine, your pants turn red. This is the signal that you can serve the customer at the counter adjacent to the machine. To serve a hamburger, press the 1 key; to serve a shake, press 2; and to serve fries, press 3. To remember which food item matches which number, glance at the icons and the associated numbers at the top right of the screen. Press a number to slide the food along the counter toward the customer.

When a customer is served, he or she may either leave with the food or may eat it and then leave. But beware: Some customers are never satisfied, and they may come back for more.

When things get really busy, you can take a shortcut. If you press the cursor-up key until you arrive at the top machine, one more keypress "wraps around" to the bottom machine. It's as though you dematerialize at the top and instantaneously reappear at the bottom. It works in the other direction, too. When you rush all the way down to the bottom machine and press the cursor-down key once more, you'll reappear at the top. Keeping this shortcut in mind may help you keep your job, especially when the rush-hour business is unusually hectic.

Keeping Score

Every time you serve a customer what he or she ordered, you receive ten points. But don't slide a customer just any old thing. Customers take only what they order; anything else falls off the far end of the counter onto the floor. When this happens, QikServe reminds you that you've made a mistake.

Also, be sure to serve the customers what they want *before* they reach your end of the counter. If you don't, they'll become angry, and when you make a customer angry, it counts as another mistake.

You have six chances to do things the way the boss wants them done. When you make six mistakes, the game is over.

Don't expect things to get easier as the game progresses; instead, things become more difficult. There always seem to be more customers demanding more food. Who said this job would be easy?

When the game is over, press any key to return to DOS, or press the space bar to play another game—if your feet aren't too tired from running.

Special Notes

QikServe is written in Borland International's *Turbo Pascal*. For programmers who are interested in how QikServe works, the source code is included on the magazine disk in a file called QIKSERVE.PAS. Note that this is not an executable file, nor does QikServe require it to run.

If you have a fast computer such as a PC AT, PS/2, or compatible, you may want to slow down QikServe to a more playable speed with "WHOA!," an interesting program found elsewhere in this issue.

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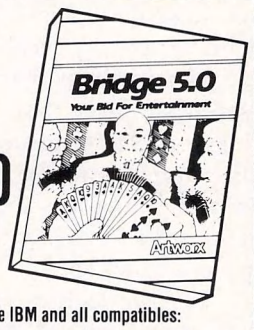

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DOS Rx

Clifton Karnes, Assistant Editor

System requirements: IBM PC, XT, AT, or compatible (including Tandy Models 1000 and 3000) with at least 256K of memory and DOS 2.0 or higher. A version on 3½-inch disks is available.

Did you ever wish DOS were easier to use? The IBM PC's Disk Operating System, PC-DOS (IBM's proprietary version), and MS-DOS (Microsoft's version for compatibles) are the most popular computer operating systems ever developed. DOS blends the best of CP/M (from the earlier generation of eight-bit computers), the best of UNIX (from minicomputers), and adds its own outstanding features. But no single operating system can offer everything everyone wants and remain a reasonable size. Many users want more than DOS provides—an easier-to-use interface, for example, and specialized disk utilities to unerase files, provide password security, optimize disk space, and so on.

Timeworks has responded to these needs with *DOS Rx*, a set of easy-to-use, integrated utilities that includes programs for disk management, data recovery, disk optimization, data security, system analysis, and more.

DOS Rx consists of two programs: *RRx*, a shell that makes DOS file-management commands easier to use; and *Rx*, a collection of tools for data recovery, system analysis, and security. The package includes a 184-page, spiral-bound manual with complete, clear discussions of both programs, a reference section, an index, and a few pages of quick-start information for those who can't wait to try out something the minute they get it home.

The *RRx* Screen

The first of *DOS Rx*'s two programs, *RRx*, can be used either as a memory-resident utility or as a command executed from the DOS prompt. *RRx*'s screen consists of three parts: information on the selected file, a directory listing, and a command menu.

The top line of the screen displays the name of the currently selected file, the date and time it was created, its attributes, and the file size in bytes.

Most of the rest of the screen is devoted to a sorted directory. A higher directory level—if one exists—is indicated by a dot, just as it is when you use the DOS DIR command. Subdirectories are shown in boldface, and the currently selected file is highlighted.

Directories can be sorted by filename, extension, date, or size. To select a file from the directory, you highlight the filename by pressing the cursor keys. To change to a new directory, highlight the appropriate selection and press Enter.

On the bottom line of the screen are commands to copy, erase, list, and rename files; change the current directory; format a disk; use global scope for find and copy commands; make a new directory; sort the directory; or show the tree structure of the current disk. To choose a command, simply type its first letter. *RRx* requests any additional information it needs and executes the command.

To get more of the flavor of *RRx*, let's go through the procedure to copy a file.

Copying Files with *RRx*

With DOS, it's easy to copy all the files from one disk to another. You simply type COPY A:*.* B: to copy every file from the disk in drive A to the disk in drive B. However, copying a large but not complete group of files—say, half of the files on a disk—is more involved. You must issue a copy command for each file, and the procedure can be time consuming.

Copying a group of files with *RRx* couldn't be simpler. You just move through the directory with the highlighted cursor, mark the files you want to move by pressing the plus key (+) on the numeric keypad, and choose the copy command by pressing C.

If you make a mistake or decide you don't want a particular file marked, files can be unmarked with the minus key (−) on the keypad. As you move through the directory marking and unmarking, a running total of the size of all currently marked files is displayed at the top of the screen.

An entire directory can be marked with the Ins key on the numeric keypad or unmarked with the Del key. Erasing and renaming groups of files is easy, too. In fact, *RRx* makes just about every file-management chore effortless.

Using *Rx*

The second program in the package, *Rx*, provides disk-management and system-diagnosis utilities, all accessible via easy-to-use pull-down menus. With *Rx* you can add or remove file security, examine a disk at the byte level, organize files by sorting or erasing, unerase accidentally deleted files, optimize your disk, analyze your system (configu-

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ration, processor throughput, and disk drive speed), configure *Rx*'s default options, and more.

Perhaps the most valuable utilities in *Rx* are the ones to optimize a disk, analyze your system, and unerase files. If you're using a floppy disk system, these are valuable tools; if you're using a hard disk, they're a necessity.

Optimizing a disk is the process of rearranging the information stored on the disk so each file uses only contiguous sectors—that is, sectors which are adjacent to each other on the disk. This makes file input/output much faster.

Report Card

When you optimize a disk with *Rx*, it analyzes the disk's file-allocation structure and generates a report card. This includes information on the disk's total capacity in bytes, the number of bytes free, how many bytes are in bad clusters, the number of user files, the number of directories, how many fragmented and empty files are on the disk, the number of files to be moved if the disk is optimized, and finally, the time you'll save by optimizing.

At this point, you have the option of either optimizing the disk or returning to the main menu. Optimizing a disk can take 20 minutes or longer, if the disk is severely fragmented.

Analysis Tools

Rx provides an arsenal of other analysis tools as well. System analysis furnishes information on installed memory, processors, video modes, DMA (direct memory access), number of serial ports, game ports, parallel ports, machine type, and release date.

Disk analysis reveals the number of heads for the current drive, the organization of sectors, tracks, and clusters, the structure of the file-allocation table, and storage capacity.

Another analysis tests the speed of your computer's microprocessor against the 4.77 megahertz IBM PC standard and summarizes the results with a bar graph.

Finally, the disk drive analyzer determines your drive's average access time in milliseconds, its transfer rate, and calculates an overall performance rating.

These diagnostics can be more than just a source of interesting information about your system. They can alert you to problems and can aid you in correcting them. For instance, one problem common to hard disks—one that can't be corrected by optimization—is inefficient interleaving.

Fixing a Hard Disk with *Rx*

All hard disks have an advertised access time. For example, a 20-megabyte PC XT–class disk will have an average access time of about 65 milliseconds. *Rx* measures the disk's access time plus the controller's, so a few milliseconds more may need to be added to the disk's advertised time to get an idea of its actual performance.

If you use *Rx* to measure a hard disk's access time and find the drive slower than it should be, you may have a problem with the drive's interleave factor—the way DOS spaces sectors on the disk, calibrated against your system's speed.

You can solve this problem by reformatting your hard disk with different interleave factors, testing each with *DOS Rx*, and fine-tuning your drive's performance.

The procedure is simple. First, be sure to back up the hard disk—reformatting erases all existing information. Then reformat the disk with an interleave factor of 2 and test it with *Rx*. Next, reformat with interleave factors of 3, 4, and so on, testing each variation. At first, the access times will drop as you increase the interleave. When access times start to rise, you've found your optimum factor.

Since reformatting wipes out everything on the disk, it's best to customize the interleave factor when the disk is new, before much time is invested in storing data on it.

Unerasing Files

There's an aura of magic about unerasing files which have been accidentally deleted, but MS-DOS, like most disk operating systems, only changes a file's directory entry and its own internal allocation tables when you erase a file. The data is still on the disk, and it stays there until you write to the disk again.

Rx's Unerase command can be used on any erased file, as long as the disk hasn't been written to since the file was deleted. It's clearly not a utility you'll need every day, but it's reassuring to have around in those moments of panic after you press the Enter key and realize that you weren't supposed to zap *that* file.

Other Options

In addition to the utilities already mentioned, *DOS Rx* comes with options to install file security (allowing you to set password protection on individual files or directories) and reorganize files (change a disk's name, physically sort directories, erase subdirectories, and wipe files and subdirectories).

The Wipe command physically destroys the data on the disk and should be used with caution. Files deleted with Wipe cannot be unerased.

As if these features weren't enough, Timeworks tops off this excellent package with a fast, full-featured, cross-directory search utility and a key accelerator program that makes a PC or XT cursor run faster than an AT's.

Everyone who uses a PC needs the utilities that *DOS Rx* provides, and anyone who wants to make life a little easier will appreciate a DOS file manager like *RRx*. In *Dos Rx*, Timeworks has provided a set of exceptional tools at a price that's hard to beat.

DOS Rx
Timeworks
444 Lake Cook Rd.
Deerfield, IL 60015
$59.95

MaxThink And *Houdini*

Keith Ferrell

System requirements: Any IBM PC or compatible; MaxThink *(minimum 300K required) and* Houdini *(minimum 256K required). Publisher notes that increased memory yields greater options to user.*

Here are two pieces of next-generation software available right now. *MaxThink* and *Houdini* are related packages which take idea processing and associational thinking, turn the concepts inside out, load them with conveniences and extras, and deliver exceptional power to their users. As developer Neil Larson points out in his very personal documentation, we are reaching the point where our PCs are liberating us from every dreary task of working with facts and ideas, leaving us more time for the fun stuff.

MaxThink, the outline processor, is among the most sophisticated examples of its species that I've seen. A committed outliner, were I to design my own program, I can think of few items not already built into *MaxThink.*

Houdini is something . . . else. Where *MaxThink* lets you arrange ideas in hierarchies at blinding speed, *Houdini* gives you the same speed for establishing relationships among ideas, intellectual networks, and webs of ideas that sprawl in all directions. No matter how tangled the threads of your thought seem to become, *Houdini* proves a sensible and sensitive navigational tool.

In practice, *Houdini* usually comes first, as clusters and groups of ideas and elements are assembled helter-skelter. Then to *MaxThink* for arrangement of argument, ideas, and structure. Finally, I export the *MaxThink* file to my word processor for text editing and preparation for printing.

But because *MaxThink,* for all of its innovations, addresses a more traditional topic—we all know what outlines are—I'll start with it.

Outlines are hierarchies of ideas, organized lists of information. They are, just as we are told by good teachers, tools for clarifying things, for sharpening argument, for eliminating extraneous material.

Word processors have delivered blessed relief from the repetition and drudge work that used to devour so much working time—but they are basically editing, not thinking, tools.

Outline processors, on the other hand, move directly to the heart of thinking, the substance which must be in place before form and shape are addressed. Good outlining plays an important part in good writing.

Not that idea processors are useful for writing alone. Any endeavor that calls for organized textual information arranged for maximum clarity or effect can benefit from being run through an outline processor. Likewise, any information that needs to be kept organized or structured can be ported to an outline. I know people who work with flowcharts, budgets, and other management tasks on an idea processor. I've even moved my name and address file to *MaxThink,* finding it faster and easier to access there than in a database.

Because they reduce your work to its most important elements, outline processors must be easy and almost intuitive to use. Your attention should be focused on the ideas and their interplay, not on their manipulation. You should be able to create parent topics and subtopics with a minimum of fuss, and fly from one to the other; you'll want to move through even long outlines quickly. You ought to be able to get a couple of views of your work on the monitor, and get visual prompts about the size of your outline, as well.

Meet Max

MaxThink succeeds on all of those counts and so many more that even a long review can only scratch the surface of its capabilities. In the first place, it has one of the friendliest and most level-headed interfaces in the field.

Where earlier *MaxThink* releases relied upon a *Wordstar*-like control-combination–heavy command structure, the latest release has stripped commands to a bare, efficient, sensible minimum. This thing is designed for speed. I've rarely seen a program whose keyboard control makes as much sense, or is as simple to learn as *MaxThink*'s. Every one of the major and most frequently used commands is accomplished by a single keystroke, and the keystrokes make sense.

Attention has been paid to detail here, both in keyboard use and outline structure. The function and arrow keys carry most of the weight of creating and getting around your outline. You can place new ideas where you need them, above or below your current cursor point. Creating a new subtopic, for example, requires nothing more than F10.

In the same manner, moving around even a long outline is a breeze. Right- and left-arrow keys move you through the levels of your outline, from topic to subtopic and so on. Up- and down-arrow keys move you among subtopics, or through parent ranges. You can also flag the most important topics, the ones you will refer to and revise again and again. *MaxThink*'s X command moves you to flagged topics in an instant.

Nor can you get lost. Esc always brings you back to the main screen; tap Esc twice and you've gotten home and cleared the buffer of commands simultaneously.

MaxThink's screen display makes the program's use even easier. On a color monitor you can set the colors you prefer, differentiating among the levels by use of the palette. Frankly, though, I prefer the way *MaxThink* looks on a monochrome screen. There, parent topics are highlighted once they've sprouted children; subtopics with children of their own also show more brightly on the screen. A function key lets you compress or expand the amount of text shown; another displays a numerical look at the number of subtopics beneath

each main topic.

All of these features serve the purpose of making the program virtually invisible as you use it. In short, they let you get to work.

Reference Room

Your work is made up of words and numbers combined to form thoughts and ideas. But those individual elements can yield gold as well. With *MaxThink*'s Ref command, you can find out in an instant how many words your outline contains, the frequency with which each word is used, and the number of unique words in your outline.

At this temporal point in writing my review, for example, I'm at 822 total words, a little more than a third of my target length. Of those 822 words, 379 are unique. The word *outline*, for example, has been used 16 times; *MaxThink* occurs 15 times, while *the* has made 36 appearances. (Those words and ideas are scattered over the whole length of the review: *MaxThink* and other outline processors free you from linear composition.)

The word reference list appears in alphabetical order. Arrow keys can be used to navigate the word list, but you can get where you're going faster simply by typing the first letter of the word you seek: You're taken to the range of words beginning with that letter. Once the cursor is on a particular word, strike Enter, and you're taken to the first occurrence of that word in your outline. You can move to each subsequent use of the word with a keystroke.

Word reference is a real plus, a *MaxThink* feature I've come to depend upon. For one thing, much of my writing is done to predetermined length; it's good to be able to get a quick count of my verbiage. For another, the opportunity to check word frequency easily and rapidly provides a chance to avoid overusing certain words. That you can just as easily check every context in which a particular word or figure appears is another, probably more important, benefit.

In Deep

The deeper you get into your outline, the more clearly you can see both the progression of ideas, and—even more vitally—those areas in which the ideas are not yet fully formed or flowing. *MaxThink* gives some terrific tools for dealing with these holes. Perhaps more accurately, *MaxThink*'s tools give you new ways of viewing your information, and from those new views, new ideas are generated.

Chief among these tools is Binsort, a process Larson views as similar to sorting materials into various bins by virtue of shared characteristics. Create your major categories with a keystroke, then dart through the outline, assigning ideas to the appropriate bin with the flick of a finger. Once you've finished, an inspection of the bins gives you a glimpse of what you have—and of what you're missing.

Sometimes there are even simpler ways to prime your idea pump. The Randomize command takes your outline elements, shuffles them, and gives them back to you in a new and often illuminative order. You can see aspects of your work that you might have missed had you stuck with a straight progressive outline.

Sorting is another *MaxThink* option that can shed light on your ideas. You have several ways to sort. Simply alphabetizing the elements of your outline may provide insight; a couple of keystrokes let you sort into alphabetical order, reverse alphabet, ASCII, and reverse ASCII.

One function I use with some regularity is File View, which displays the outline as it will look in print. Seeing the structured hierarchy of ideas, each one numbered properly, gives a good sense of the flow you've achieved. In File View mode, though, you can't edit—only view.

MaxThink remains easy to handle as your outline expands or grows more complex. A clone feature simultaneously amends all occurrences of repeated data. You can lock the cursor onto topics and drag them around the outline until you find the spot where they fit best. An undo feature lets you correct a hasty keyboard decision.

Extras

Just as an outline is a tool which can serve many functions and purposes, so can an outline processor do more than just process outlines. Larson notes more than once the effects of serendipity: finding gold on his way to something else.

A good example is the Treedir function. A disk directory is a hierarchy of information. *MaxThink*'s Treedir feature gathers your files into outline format, with subdirectories as subtopics, files as subtopics. This is a sharp utility that has, for me, become indispensable.

Other extras include Wallchart, which takes *MaxThink*'s organization and makes it visual. Another feature lets you work with graphics.

There are plenty of options, too. The format of your outline is up to you. You can use the standard Roman numeral/capital letter/Arabic numeral progression, the military numeral and decimal combination, bullets and dashes, and so on. You can customize the date line, set frequency of save reminders, alter the way outlines are readied for your word processor.

For dealing with information that needs structure and organization, *MaxThink* has it all.

Here's *Houdini*

Suppose, though, you're approaching a project that calls for a round of intuitive thinking before you dive into structured thinking and organization. That's where *Houdini* enters the picture.

Where *MaxThink* provides useful tools for accomplishing powerful hierarchical purposes, *Houdini* is equally simple to operate, creating families and intertwined chains of ideas rather than formally structured outlines.

Houdini lets your thoughts branch out in dozens of directions, giving you quick keyboard control of linkages and relationships among the data you're associating

your way through. You can link one thought to another, establishing inputs and outputs from categories, sorting and viewing relations among ideas and elements, facts, and figures.

In short, *Houdini* is a hypertextual idea processor that liberates your thinking from every pattern you've locked into. It doesn't even look like a traditional word or idea processor.

Work Screen

The first thing you notice is how different *Houdini*'s screen appears. Rather than the basically blank page that *MaxThink* and most word processors offer, *Houdini*'s screen consists of a box in which text is entered. As soon as you've made a couple of entries, the screen becomes more malleable: You have several ways of viewing the relationships among your thoughts.

It takes some time to get used to viewing your work as individual elements linked to other elements. I balked at first at the strangeness of the *Houdini* screen, but after only a couple of hours had come to feel at home with it. What becomes important is not appearance, or even structure, but nodes where ideas come together from several directions. Trace the paths of links among the nodes, and there's no telling where you'll end up.

Working on a flowchart, for example, I entered as nodes each of the individuals involved in a project. Other nodes included budget, responsibilities, and so on. It was a simple matter to keyboard the relations among the people, the resources, and the project goals, with *Houdini* letting me spotlight areas of repetition and duplication of effort that I might otherwise have missed.

As Larson points out in the *Houdini* manual, the program offers analytical as well as creative benefits. Because you can load ASCII text files into *Houdini*, just as you can into *MaxThink*, documents needing a critical eye can be popped into *Houdini*, where links and nodes among ideas can easily be identified.

Larson's efforts are once more aimed at providing the most power for the least effort. Most of the major functions—linking ideas, establishing chains of ideas, defining inputs and outputs among concepts—are accomplished with a single keystroke. Once more, the keys that get the most use are the function and arrow keys. It's very easy to create very large, very complex webs of ideas.

Houdini has gotten shorter shrift here than *MaxThink* because it's harder to describe exactly what it does. The program is so intuitive and flexible that I would hazard a guess: Six Houdini users use the program in six—or more—different ways.

Practical Matters

Both packages print well, with *MaxThink* generating outlines of such sharpness as to make an English teacher weep. *Houdini* gives a variety of print formats that make real the relationship chains you've constructed. Both programs export nicely to word processors.

Both packages come with cleverly designed tutorials which use familiar lists—TV programs, airline schedules—as exemplars of hierarchical and associational information. Spending a few minutes with the tutorials gives you the basics. Advanced exercises show how to make this software sing.

There's also 70K of contextual help screens built into *MaxThink*, accessible at the flick of the F1 key. The help screens are packed with information and are nicely organized, reminding you of the purpose of different keys, and so on.

Documentation: Delightful And Deranged

If the packages were half as powerful as they are, they'd be worth nearly the price of admission just for the manuals that accompany them. You've never seen documentation quite like this.

For one thing, the manuals are big, the size of a coffee-table paperback. The size is just right. It allows for heavy type, plenty of white space, readability. That's appearance, though. The whole point is substance, and the documentation is unusual here, too.

For one thing, Larson's manual style is wholly his own. His tone ranges from a patient tutorial voice to the enthusiastic harangue of a professional motivator. All of the information is carefully and well organized. Scattered like pearls among the program notes are quotations from psychologists, examples of managerial thinking, tips for money-making projects, and more.

All of it is exuberant, and all of it is riddled with typographical and spelling errors, malapropisms, occasional howlers. You get used to it after a while, but the number of errors do make you wonder about the spelling and grammar checkers Larson advertises for sale. The malaprops and non sequiturs I found delightful: This software has a human being behind it; this manual wasn't written by a committee.

Updates and revisions come out regularly and are reasonably priced; there is a newsletter for *MaxThink* users. Technical support often comes from Larson himself, who looks for input aimed at adding features to future releases.

There are a few things I would like to see. *MaxThink*'s Z command lets you switch between two outlines; I'd like to have a few more windows available. Subdirectory support in the current release calls for customizing the options list when you want to designate a particular subdirectory for saving outlines. *Houdini*'s version of word referencing doesn't contain a total word count.

Those are, though, more luxurious upholstery for what are already two of the sleekest and most useful pieces of software on the market. Larson's default sign-off is *MaxThink Forever!*

I couldn't agree more.

MaxThink
Houdini
MaxThink
230 Crocker Ave.
Piedmont, CA 94610
(415)-428-0104
$89 each

Writer's Handbook

Ervin Bobo

Requirements: IBM PC, XT, AT, or compatible with at least 128K of memory.

In the days when I was writing fiction, *Writer's Handbook* could have been one of my most valuable tools, replacing several of the reference books that kept falling off my desk. Now I deal mostly with fact, but the need for precision has not lessened. And my PC is much larger than my old typewriter, leaving even less room on the desk.

Described as a memory-resident reference for writers, the *Handbook* combines the features of a thesaurus, dictionary, almanac, grammar reference, and more. But perhaps the nicest thing about the *Handbook* is that it's always handy—only a few keystrokes away.

You might be wondering how this much reference material can fit into your computer as part of a memory-resident program, particularly since the *Handbook* runs on systems with as little as 128K. Actually, only the skeleton of the *Handbook* is memory-resident, hiding somewhere behind whatever word processor you may be using; the meat of the program must be read from disk. For this reason, two floppy disk drives or one floppy drive and a hard disk are strongly recommended. On a one-drive system, you have to remove your word processor and insert the *Handbook* disk each time you need information. This swapping could quickly become a chore.

Since *Handbook* may be copied, it's easy to install on a hard disk, which provides even quicker access. The only thing you have to remember is to load it before booting your word processor.

This brings up another point: Although the minimum memory requirement is 128K, it really depends upon the word processor you use. For text-mode programs, *Handbook* sets up a 4K buffer; but if used with color/graphics adapter (CGA) programs, a 16K buffer is required. For this review, I used IBM's *Writing Assistant* with a 640K machine, so I never experienced any difficulty.

Hot Keys

Configuring *Writer's Handbook* to your system is easy with a menu selection that allows you to choose "hot keys" (the key-combination that activates *Handbook*), the graphics mode option, display colors, and so forth. All of this information is saved to disk. The next step is to boot *Handbook*, and then boot your word processor.

The default hot key is Alt-F1, though this can be changed if it happens to be a combination already used by your word processor. Anytime you press the hot key, a windowed menu pops open in the center of your screen (this is the part of *Handbook* that is memory-resident). This initial menu is for the Rules section—rules governing abbreviations, capitalization, diction, expressions, synonyms, homonyms, and antonyms.

If you choose one of these selections, *Handbook* accesses the disk to bring up another menu. If you picked the Capitalizing selection, for example, you'd see a list of subjects of common concern, such as astronomy. When you cursor to this item and press the Return key, you get the accepted rules for capitalizing the names of heavenly bodies, as well as one or two examples.

After using any part of *Handbook*, press the Esc key to backtrack through the subsections until you return to your original document.

Calendars and Almanacs

In the Info Bank section, there's a mini-almanac. In the Calendars section, you can look up dates and holidays. The Computerese section defines most of the shop-talk terms of computer terminology; the Foreign Phrases section defines (and provides the correct spellings for) things such as *cum laude* (Latin) and *au naturel* (French). Under the Misspellings section, you'll find a list of words most often misspelled; under Signs and Symbols, you find definitions of special notations used in science, mathematics, and other fields.

Note, however, that the Misspellings section is not a spelling checker; it simply provides a list against which you can check suspect words.

The third section of *Writer's Handbook* is subtitled Letters. This area has examples of various types of correspondence, showing you how to model your own business letters. In its subsections, you'll find examples of business letter parts and styles; examples of letters of acknowledgement and request; and even rules for preparing envelopes.

A Learning Tool

Rather than simply stating a rule, *Writer's Handbook* usually tells you *why* the rule exists, and then it furnishes examples. Because of this, the program may even become a learning tool as well as a reference work.

The makers of *Handbook* also distribute a program called *KeyNotes* that lets you write your own notes—or rewrite the rules of grammar and usage—and incorporate them into *Handbook*.

The documentation accompanying *Writer's Handbook* is rather skimpy. The manual contains only about 30 useful pages, and some subjects, such as the Letters section, are mentioned only in passing. Still, it does tell you how to get around within the program and what to expect when you get there.

Anyone who has ever written seriously, whether for fun or profit, realizes the need for handy reference materials on such topics as grammar, punctuation, form, and style. *Writer's Handbook* gives you all this and more. It's a tool that can quickly become indispensable. Couple it with a good word processor that has its own spelling checker, and you should have everything you need but the inspiration.

Writer's Handbook
Digital Learning Systems
4 Century Dr.
Parsippany, NJ 07054
$39.95

Byte Size Software

Buddy Cooper

System requirements: IBM PC, XT, AT, or compatible with at least 256K of memory; printer recommended with some packages.

Software is getting more useful and more affordable all the time. The new Byte Size series of programs from Publishing International breaks the $20 price barrier and delivers solid, if occasionally quirky, value. In fact, some of the Byte Size programs provide more features and are easier to use than similar packages at two or three times the price. Every program in the Byte Size series sells for $19.95, except for *Word Processor*, which is $21.95.

Floppy Disk Log

I've had a stack of unlabeled floppies on my desk for a long time. More than once I've intended to look at these floppies, organize them, and cull them. While I never quite got around to the job on my own, *Floppy Disk Log* made short work of the task. The program is menu-driven, easy to use, and sometimes entertaining (there's a great boing! sound when you enter the main menu).

To get started, you select option 1 from the main menu, *Add a new disk to the log*. The program prompts you to label the disk and then stores all of the filenames found on the floppy being logged. (If the floppy contains subdirectories, only the filenames on the root directory are logged, however.) The resulting log can be copied to the disk containing the logged files, and it can be printed.

The printing routine in *Floppy Disk Log* could stand some improvements. For one thing, it ejects a sheet of paper before printing, thus wasting a sheet each time; for another, it doesn't warn you to prepare the printer before it starts to print. It does advise you if the printer is turned off, but this doesn't help if you've just printed some labels and have forgotten to switch back to paper. Another problem is there's no option to print a copy of just one disk's log. You must print out the entire log each time.

One good point of the printing function is that it asks if you want a printed label for the disk. If you do, *Floppy Disk Log* prints a neat little label on a standard 4 × 1 inch form showing the disk name, the number of files, and the date the files were logged.

Filename Descriptions

Another good feature allows you to add descriptions to filenames. This is particularly valuable for programmers who want to catalog a diskful of useful algorithms and subroutines. Programmers always seem to give their bits and pieces of programs one- or two-letter filenames to save time, and then have trouble remembering which file does what.

In addition to helping you organize your disk library, *Floppy Disk Log* has a search feature that allows you to scan all logged files for a particular file. You can search by filename or by description, similar to Peter Norton's Find File program.

One area where Byte Size Software has definitely cut corners is in documentation. You don't really get a manual with a Byte Size program; instead, you get a paper reference guide, and the real manual of operation is stored as a text file on the program disk. You can manipulate the disk-based docs with your word processor before printing them out, and with a little forethought you can generate a decent manual with a table of contents, page breaks in the appropriate places, and numbered pages.

Color Systems Only

While not documented, apparently *Floppy Disk Log* is designed for color systems only. I use a monochrome monitor driven by a color/graphics adapter (CGA) and was able to make out most of the screens, but some were almost completely unintelligible. However, in color, the screens are clear and easy to read. The Byte Size *Calendar*, described below, includes a function for loading the program on a monochrome system, a feature that should be extended throughout the Byte Size line.

Floppy Disk Log has a few other quirks as well. When an error message appears, the only escape seems to be *Hit a key to return to DOS*. It would be much more convenient if you could return to the main menu.

Still, *Floppy Disk Log* can be very useful. After running my burdensome stack of floppies through the program, I quickly ended up with a neat, printed catalog of several disks. The catalog includes some disks that had been misplaced for so long that I had given them up for lost, plus a stack of unneeded floppies ready for the recycling box.

Hard Disk Log

According to the disk-based documentation, *Hard Disk Log* is designed to run on a "computer that has at least . . . one hard disk drive." And, if that's not sufficiently redundant, the printed reference guide states that the program requires a computer with "two disk drives, one of which can be a hard disk."

As with *Floppy Disk Log*, the screens in *Hard Disk Log* are bright, clear, and readable—as long as you have a color monitor. On my CGA-driven monochrome monitor, the main menu again was unintelligible. However, monochrome users should note that when the Esc key is punched to exit the program, the menu suddenly becomes readable. If you then abort the exit procedure, the screen remains readable (although the highlight bar, used for selecting files and subdirectories, makes the selection unreadable). Like *Floppy Disk Log*, *Hard Disk Log* could be improved with some color/monochrome installation options.

At its core, *Hard Disk Log* is an

XTREE-like program. It starts by alphabetically indexing and listing on the screen all of the files and subdirectories on the root directory of your hard disk. It also allows you to delete, rename, and search for files; run programs; print a copy of the directory displayed on the screen; display the contents of subdirectories; and add or edit comments attached to files. To assist you in remembering all this, the F1 key pops up a good help screen.

One thing *Hard Disk Log* doesn't do is let you delete the contents of an entire subdirectory at once. You can delete individual files very quickly, but there is no provision for tagging several files and deleting them as a group.

The file search is quick. It seems as quick as Norton's and takes less screen space to report the results, but that's because *Hard Disk Log* reports less information. The quick disk search for a file notes all matches and displays the path to each one on the screen. Global wildcards (* and ?) are permitted. If the screen fills up with matches, the program waits for you to press the space bar to continue. In my opinion, this is better than trying to read a continuously scrolling screen, such as the one displayed by Norton's program.

Renaming a file is quick and easy, too, but there's no provision for renaming subdirectories. Overall, though, I have to rate *Hard Disk Log* as a handy, quick utility for use with a hard disk.

Calendar

The Byte Size *Calendar* is a handy calendar/appointment program that includes a printing feature—a feature noticeably absent from *Sidekick*'s calendar. *Calendar* can be loaded as a stand-alone program or as a memory-resident program. When loaded as a memory-resident program, *Calendar* is popped on and off by punching the Alt-C keys.

Once running, the program puts a calendar for a full month in the middle of the screen. Entering appointments is very easy; just cursor to the desired date and enter the information. Later, when you run *Calendar* on that date, the program sounds an alarm and displays the appointment on the screen.

To the left of the calendar is a to-do list. Items entered in this list remain until deleted. This provides, in effect, a "hot list" which prompts you with items that need immediate attention, no matter what the date. When you delete an item from the to-do list, it is automatically transferred to a list of things done. The second list doesn't immediately appear on the screen, but it can be displayed or printed later.

You can scroll through the months of a calendar by pressing the plus key to scroll forward or the minus key to scroll backward. When scrolling through months, the cursor always appears on the first day of the month; but when you return to the current month, the cursor also appears on the first day—it should return to the current date.

Memory Confusion

When *Calendar* is loaded as a memory-resident program, it is not entirely compatible with certain other resident programs. Of course, this is always a danger with resident programs, and it can lead to problems and inconveniences. For instance, if *Calendar* is loaded before *Superkey* and *Sidekick*, and then you exit *Calendar* by pressing the Esc key (as in the stand-alone version) instead of Alt-C, *Calendar* is wiped out of memory—and it takes *Superkey* and *Sidekick* along with it.

Another difficulty becomes apparent when automatically loading *Calendar* from within an AUTOEXEC .BAT file. Execution of the batch file halts when *Calendar*'s title screen appears, and you have to press a key to continue.

Since the stand-alone version of *Calendar* loads quickly, it makes sense to use the program this way instead of installing it as a memory-resident program, particularly if you like to use other memory-resident utilities.

Constant User

There are some other weaknesses in this program. For instance, when you're adding items to the to-do list, you must press the cursor-down key to advance the cursor to the next line; there is no automatic word-wrapping. Also, date-sensitive reminders are limited to 25 characters. And when I tried to print the things-done list, three out of four times nothing happened.

The program's most useful feature is its ability to print the current month's calendar with the daily reminders, and, if requested, the to-do list. Even here, though, there are some quirks. The schedule doesn't automatically eject from the printer, and the program always prints one day more than the number of days requested. Nevertheless, it's a handy feature that's seriously lacking in the *Sidekick* appointment calendar.

Despite its limitations, our office uses the Byte Size *Calendar* program constantly. Other offices have found the program equally indispensible. It prints an attractive schedule with a small 2 × 3 inch calendar for the current month at the top, followed by the to-do list and the daily slate of reminders and appointments. The schedule can be printed in two formats: in columns or in "black book." We use the column format for posting schedules on the wall or leaving on a desk. The black book format allows you to fold up the schedule and shove it into a pocket.

All three Byte Size programs I reviewed are quirky but very useful, and they could be greatly improved with a few revisions.

There are other Byte Size programs available, too. *Word Processor* is self-descriptive and boasts an automatic spelling checker. *Stock Portfolio* is designed to keep track of stocks and make certain financial computations. *Phone and Address Filer* is billed as an automated phone book and address system. There's also *Time and Expense Log, Calculator, Telecommunications,* and *Home Inventory*. Finally, for the completist, there is *Recipe Finder,*

Coupon Finder, and *Gift List*.

Floppy Disk Log
Hard Disk Log
Calendar
Byte Size Software
Publishing International
1209 West Knickerbocker Dr.
Sunnyvale, CA 94087
$19.95 each

Action Tracker

W. Fred Schnibben

System requirements: Any IBM PC, XT, AT, or compatible with at least 384K of memory and two floppy drives; hard drive recommended.

Haven't you ever wished you were more organized? If you're like most people, you can't help wondering, "What could I have accomplished today if I had planned ahead?" Well, with the help of your PC, there may yet be hope.

Action Tracker is a new program designed to help you organize and track your daily schedule, office tasks, and a wide variety of projects. The package looks almost like a game with its cartoon cover, but appearances can be deceiving. *Action Tracker* is far more serious than it appears at first glance.

Jump Start

Installing *Action Tracker* on your system is quick and easy thanks to the *Jump Start Manual* included with the package. If you hate to read long manuals and want to see what you've bought without delay, *Jump Start* is the answer. The instructions are clear and are augmented with a few brief examples. While more samples and some application suggestions would be helpful, the *Jump Start* approach satisfies initial curiosity. It also gives you a better understanding of the information that's required later when you enter your own data into the program.

Action Tracker's main menu is very straightforward, offering access to any of the submenus with the touch of a function key. Entering data is made easier by the program's automatic insertion of slashes in dates, colons in times, and dashes wherever required.

One feature of *Action Tracker* I appreciated is the generous size of the data fields. Nothing is more frustrating than running out of room when you're trying to enter the name of a town or a client which just doesn't fit in a field. *Action Tracker* gives you plenty of room.

Getting Down to Work

To put *Action Tracker* through its paces, I decided to use a simple construction job as a model—one that was comprised of several phases with different people involved in each phase. I happened to be in the process of building a kiln, so I used that as my first *Action Tracker* project.

Jobs were assigned, including design planning, purchasing, construction phases, and heat testing. Then, with the help of *Action Tracker*'s report writer, an assignment sheet was generated for each person, showing what was expected for that phase of the project. The report told them what to do, how much time was allocated, and, if money was required, the amount budgeted for that phase. The project manager (myself) received a master list of who was to do what, when it was to be done, and how much should be spent.

For further tests, I set up a club project, as well as various office functions and schedules. As the chairman of a committee to give a party for the members of the club, I assigned jobs to each of my helpers, with dates designated for completion, and budget information where it was needed. Then each person was given a copy of his or her task. All I had to do was call my assistants to see if they were proceeding on schedule.

Action Tracker's greatest effectiveness, however, seems to be in the office. I set up a list of office personnel by department. Then, using current projects and schedules, each person or department was given assignments.

To my surprise, I realized that some people were terribly overburdened, while others were twiddling their thumbs. With this information available, I quickly redistributed the work. *Action Tracker* can be a great tool for increasing office efficiency.

Sophisticated Features

After setting up the projects, I was able to explore some of the more sophisticated aspects of *Action Tracker*, such as the budget and reminder features. It is possible to project costs and then enter actual costs as they occur. You can get a daily report on the percentage of completion and the cost status. You can also insert reminders to produce reports in advance of scheduled dates. All of this—plus a report on who has done what and how many jobs remain unfinished—is a handy thing to bring to a staff meeting.

If you enter sensitive information into the program, such as payroll numbers, you may want password protection. This option is available in *Action Tracker* and is fully covered in the manual.

But the real value of *Action Tracker* is what you get last: the myriad reports. The program comes with 14 very useful reports already designed and set up for you. These can be viewed on the screen, sent to a printer, or copied to disk. You can include budget information in these reports wherever it is pertinent.

Action Tracker worked well in each situation in which it was tested, and it generated a wealth of information on each project. If you use the program's action lists, project lists, schedules, and other reports to organize your time and resources, it will almost certainly improve your productivity. After a long look at this program, I feel that it's like a chameleon: It adapts well to a countless variety of projects.

Action Tracker
Information Research Group
2421 Ivy Rd.
Charlottesville, VA 22901
$198

Career Navigator

Steve Hudson

Requirements: Any IBM PC, XT, AT, or compatible with at least 256K of memory; letter-quality printer recommended.

"Good luck in your new job!"

Those words are music to the ears of job hunters, but for many in the job market, they're a long time coming. *Career Navigator* is a computer program designed to help.

Career Navigator taps the job-placement experience of Drake Beam Morin, Inc., a New York–based career-counseling and outplacement firm. DBM's career counselors have developed a good idea of what it takes for an individual to find a suitable job, and they've distilled that expertise on four floppy disks.

The result is a menu-driven program that should be of interest to anyone looking for a new job.

Computer Counselor

Career Navigator assigns your computer the role of an electronic career counselor. Features include an explanation of job-hunting strategies, employer characteristics, and likely interview situations. In addition, like any good counselor, it "listens" as you explain your wants and needs. Unlike human counselors, however, *Career Navigator* has a perfect memory and infinite patience.

Career Navigator also functions as a part-time psychologist, analyzing your answers and using the results to help you learn about yourself. Best of all, the software goes one step further, helping you apply what you learned to the task of looking for a new job.

The program's great strength lies in its ability to make you organize and record information. It then helps you apply the resulting insights to a structured job search.

Smart Talk

To evaluate your approach to communication, for instance, *Career Navigator* first gives you a short quiz. Then, after evaluating your responses, it graphically depicts the components of your personal communication style. As the manual points out, you can use the resulting insights to optimize interpersonal communication during interview situations. The result, of course, is a better chance of landing that lucrative job.

Obviously, you could do this without the program—but the fact is, you probably wouldn't. And that is how *Career Navigator* helps you. It gives you a structured environment in which you can get a handle on the myriad things it takes to get a good job.

One of the first tasks faced by any job seeker is the matter of deciding what kind of job you want to find. *Career Navigator* identifies your interests, skills, and objectives, allowing you to combine them into sets of criteria that describe potential jobs.

To really stretch your imagination, it also has built-in "dice" that randomly generate sets of job criteria for your consideration. Each roll of the dice produces a new combination of criteria, and each combination represents a potential job. Some, of course, are ridiculous and farfetched. But others may get you thinking about possibilities you had never considered before—and that, as career counselors will tell you, can be a key to finding the job that's right for you.

Resumé Ready

Once you've narrowed your target area, *Career Navigator* also offers a helping hand in the resumé department. One of the most troublesome aspects of any job search is the matter of putting together a resumé, but this program gets you off to a flying start. Using your own input, it automatically produces a rough resumé in one of three forms. You can then fine-tune the resumé to match the positions at hand.

Basic text-editing features are built in, allowing you to customize the resumé within *Career Navigator*. Alternatively, you can leave *Career Navigator* and customize the resumé with your favorite word processor. *Career Navigator* saves your rough resumé as an ASCII (plain-text) file.

One fascinating (and recurrent) feature is the program's use of computer-aided instruction. From time to time, as you work through the package, you'll encounter on-screen quizzes that reinforce what you've learned from the manual. You'll also encounter what-if scenarios that let you deal with various job-hunting situations. You get instant feedback on your answers, along with comments on your responses.

As you use the program to plan and develop your job-hunting strategy, you'll soon be ready to mount an active job-hunting campaign. *Career Navigator* allows you to develop a campaign plan; it also lets you create weekly plans of action to keep you on track.

Evaluating Offers

Sooner or later, your efforts will probably pay off with one or more job offers. That's when another intriguing feature, the program's job-offer evaluator, comes into play. Early in the program, you're asked to identify the factors (location, salary, work environment, and so on) that would describe your ideal job. The program remembers your best-choice parameters. Then, at any time, it allows you to compare any job offer to what you've defined as ideal—and it even gives you a graphic evaluation.

Career Navigator also gives you numerous printouts. In addition to the working resumés already noted, it provides lists and summaries in abundance. It produces a "campaign plan" to help you optimize your job-hunting time, and it prints a weekly action plan to help you keep up with your day-by-day job search. The program even includes a function for preparing mass mailings, although it can be used only with the built-in word processor.

Career Navigator runs smoothly. No difficulties were encountered

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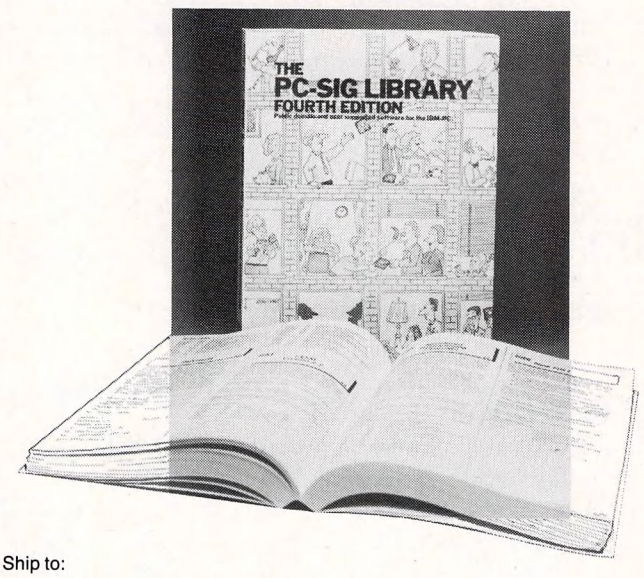

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with any of the program's features, although a moderate amount of disk swapping is required on a PC with no hard disk. Thanks to clearly labeled disks, swapping takes place without a hitch.

There were one or two quirks that took a little getting used to, however. When entering text to describe career accomplishments, for example, several blank lines are provided—but there is no automatic word-wrap at the end of a line. That's not tragic, but it does trip you up the first few times. Touch typists, beware. Another text-related quirk that showed up occasionally was a slow cursor when deleting text.

Perhaps the most puzzling quirk is a single inconsistent use of the cursor keys. On most menus, you move up and down using the up-arrow and down-arrow keys. That's logical. However, in *Career Navigator*'s target objective menu, you move up and down with the left- and right-arrow keys.

Detailed Documentation

The manual, divided into two parts, is generally very helpful. The first portion takes you step-by-step through the program; the second covers computer-related details.

Experienced computer users will appreciate the smooth flow of the first part, which is unencumbered by computer instruction. However, less-experienced users will have to do a lot of back-and-forth page flipping.

Besides guiding you through the program, the manual also serves as a basic text on the ins and outs of job hunting.

Unlike some job-hunting guides, which simply state the obvious, this one offers genuinely useful information. Its case studies are particularly valuable, as are its examples of interview strategies and networking techniques. By itself, the manual is intriguing. Coupled with the program, it's part of an exceptionally valuable tool.

The program is easy to install as well. No problems were encountered when setting up the program on either a hard disk or floppy disk system. The user interface is straightforward, too, thanks to the intelligent use of menu windows. Comprehensive context-sensitive help screens are available at the press of a key, and encouraging nuggets of job-hunting wisdom can be called up at any time.

Career Navigator is a tool for the serious job seeker. If you follow the recommendations in the manual, it takes a number of hours to work through the program's modules in sequence, so some investment of time is required. But if you're looking to change jobs, those could be some of the most valuable hours you'll ever spend.

Career Navigator
Drake Beam Morin, Inc.
100 Park Ave.
New York, NY 10017
1-800-345-JOBS
$129
(Student Price $95)

Gunship

Ervin Bobo

Requirements: IBM PC, XT, AT, or compatible with at least 256K of memory, and a color/graphics adapter (CGA), enhanced graphics adapter (EGA), or equivalent. Also compatible with the Tandy 16-color mode.

At the Summer Consumer Electronics Show held in Chicago last June, MicroProse introduced *Gunship*, its helicopter simulator for the PC, by setting up a Link trainer keyed to the software. If you're not familiar with a Link, it's a capsule mounted on gimbals, and as the pilot pushes and pulls on the controls, the capsule tips and dips in response—a true simulator.

Inside the capsule, a closed-circuit video camera captured the facial expressions of those "flying" *Gunship*, a simulation of the AH-64 Apache attack helicopter. The video image was sent to monitors outside the trainer. Watching the faces of the flyers was probably more revealing than sitting in the Link itself.

The computer store dealers, magazine editors, and other people taking turns in the Link seemed totally immersed—some of them to the point of displaying fear (or at least deep concern)—and I have no doubt that many left the capsule with clammy hands, sweaty brows, and a faster-than-normal pulse rate.

Gunship, even in the privacy of your home or office, can have the same effect.

Combat Course

To begin with, *Gunship* offers a wide variety of combat missions, including a state-side training flight in which your enemy is firing simulated ammunition at you. Although it is impossible to get hurt or crash in this mode, you can still earn a score, a promotion in rank, and even a medal.

Gunship, *a colorful and superbly crafted helicopter simulation.*

After that, things get tough. You select one of four potential world trouble spots, then choose one of three different styles of flying (which might better be called levels of difficulty). After that, you select a Reality Level with variables such as weather, flight control, landings, and the quality of the enemy. Since there are many combinations of these categories, the number of mission scenarios is very high. It will be some time before you've exhausted them all.

Following a mission assignment, you go to an armaments screen where you must decide on the fuel and weapons needed to complete the job.

Although the Apache normally is armed with a bit of everything,

you may want to go heavy on Sidewinder missiles for an air mission; carry more FFAR rockets if your targets are emplacements; or load up on Hellfire missiles if you're going to be fighting armored vehicles.

Alternatively, you may want to leave some weapons behind in order to carry more fuel for a long-range mission. Getting back to base after accomplishing your primary and secondary missions is more important than firing at targets of opportunity.

Playing tip: Always carry a few Sidewinders for air-to-air combat. Your nemesis in *Gunship* is the Soviet-made Mi-24 Hind attack helicopter. You'll find it to be more than a handful.

For some reason, the Hind seems more aggressive and maneuverable in the PC version of *Gunship* than it is in the Commodore 64 version.

See Here

Your view in *Gunship* is from within the cockpit of the Apache. The game is primarily keyboard controlled, although steering can be controlled with a joystick.

You use the keyboard to start your engines, engage the rotor, select weapons, check stores and damage, jam radar or infrared detection, change views, read the map, and do much more. To make all this simpler, the package includes three keyboard overlays to fit traditional IBM keyboards, new IBM keyboards, or Tandy 1000 keyboards. About a week of intensive play is all it takes to to commit the most commonly used controls to memory.

Some helicopter simulators combine the collective and cyclic controls into the joystick, as it is on real choppers. *Gunship* makes the operation less confusing for us nonpilots by confining the collective (lift) to the keyboard and the cyclic (pitch and roll) to the joystick.

Mind the Map

At the center of the control console is a satellite-view map, showing your chopper, your base, and the main terrain features. Just above this is a message bar that occasionally informs you of a radio message. Pressing the space bar toggles the message into view; pressing it again toggles you back to the map.

When the message bar reads *Target,* you must press the fire button to lock on to your enemy. At that point, the console display shows a video image of your target. Fire at it by pressing the button again—providing it isn't "friendly." Destroying some of your own forces by mistake brings a nasty reprimand over the radio.

Since your missions depend upon locating a target, destroying it, and then returning to base, you'll find the map a most helpful feature. More complete than the console display, the main map is toggled by pressing the M key. It then replaces the playing screen and shows you the location of your targets and bases, and also displays a moving icon of your chopper.

For damage assessment, yet another screen is available. It highlights the damaged parts of your chopper and displays a chart that indicates the degree of damage. Since you can't fix anything, this routine is fairly useless, except as a means of telling you why you're about to crash.

Scoring

Scoring is rather complex. What counts is whether you accomplished your primary and/or secondary objectives, whether you returned to base or landed behind enemy lines, the amount of damage sustained by your chopper and yourself, and whether you survived.

Once these parameters have been digested by the computer, you're awarded a point score which accumulates on a pilot roster—a hall of fame listing. Included are the records of any decorations or promotions you may have earned, as well as information on whether you are missing in action or killed in action. Obviously, if either of the latter two conditions apply, you'll have to start a new pilot before you can fly again.

Solid Graphics

Gunship overcomes one of my main gripes about games for the PC by presenting graphics that are well done and executed in 3-D solid form. Those who have EGA cards and monitors or Tandy computers will enjoy *Gunship* even more, because the 16-color display is much more realistic than the standard 4-color CGA screen.

Sound effects, of course, are subject to the limitations of the PC, yet MicroProse manages to wring quite a lot out of the computer.

The manual is written in MicroProse's usual military style and tells you probably everything you ever wanted to know about flying a chopper in general and the Apache in particular. It's also very informative about weapons and enemy capabilities.

Copy-protection is in the form of an identification routine that must be performed with the aid of the manual. On your screen is a drawing of a war machine, and you must correctly identify it before being allowed to proceed. This makes the program useless without the manual, while still allowing you to make backups or install the program on a hard disk. In fact, there are passwords and countersigns scattered throughout the manual. Since it's necessary to use them for all but the training mission, it would be nice if they were gathered in one place.

Gunship must be measured against other entries in what has become a new category of computer simulations. Not only is it at the top of the heap, it almost defines the category by setting new standards for all the helicopter simulations sure to follow.

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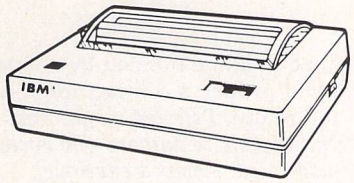

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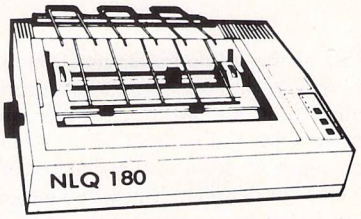

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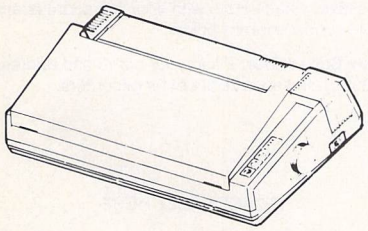

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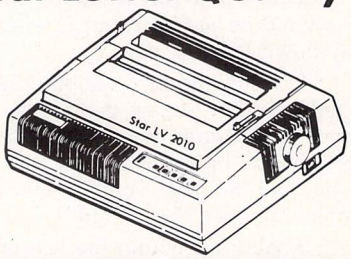

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1. The upper left corner of the first page of your article should contain your name, address, daytime telephone number, and the date of submission.

2. The following information should appear in the upper right corner of the first page: the language in which your program was written and the maker of that language, if applicable (for example, if your program was written in C, which compiler was used); the size, in kilobytes, of both your source code and executable object code; and any special requirements for your program (memory size, color or monochrome display card, hard disk, printer, modem, and so on).

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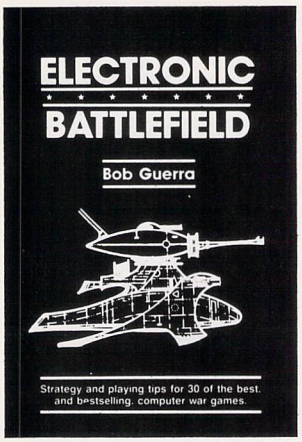

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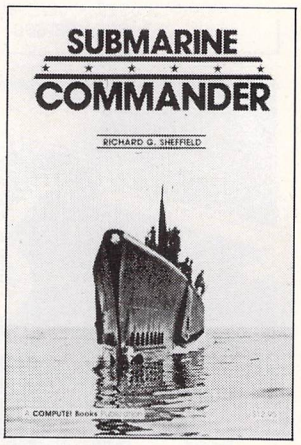

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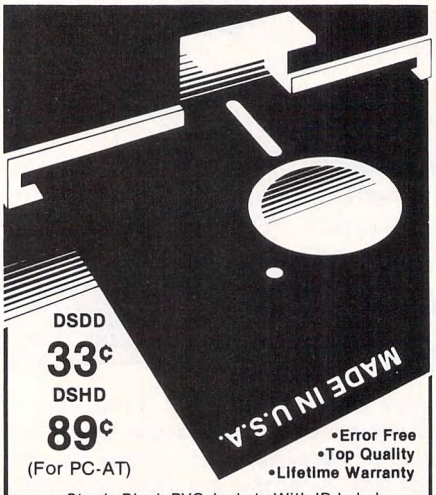

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Descriptions of all the files on the disk are contained in a file named README. You can display this file on the screen by entering TYPE README at the DOS prompt. Hold down the Ctrl key and press NumLock (HOLD on Tandy machines) to pause scrolling ; press any other key to resume it. (Some computers have a special Pause key for this purpose.) You can read the file more easily by loading it into your word processor, or by printing it with the DOS command COPY README LPT1.

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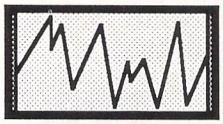

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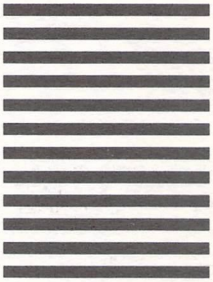

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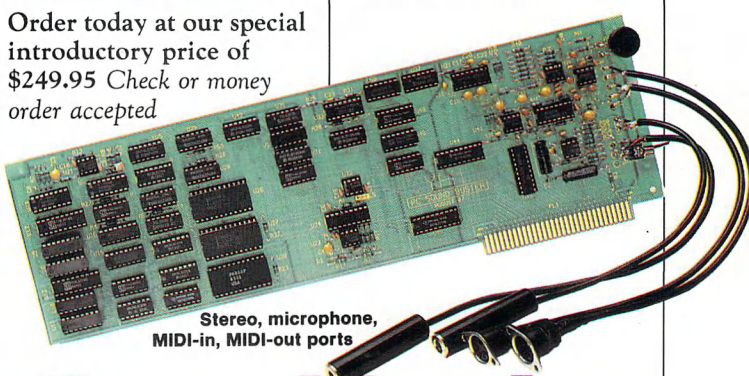

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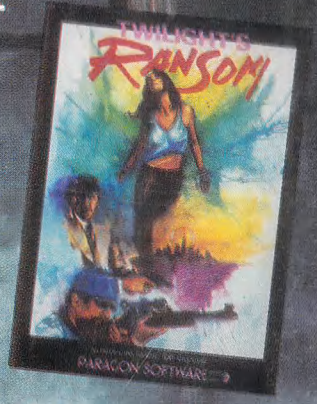

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